NATURE MAGAZINE

PROVISO TOWNSHIP
HIGH SCHOOL
LIBRARY
MAYWOOD, ILL.

MAY 1926

35 CENTS A COPY.

You Can Do This *with Tulips*

Joy will burst out from your garden and command the mood of every passer-by if you plant a bed of Elliott's wonderful tulips. No plant is more expressive of the gladness of the year.

For supreme effect, get the truly regal kinds that Elliott offers—big bulbs, the very choicest produced for 1926, sure to live, sure to make the most vigorous growth, true to type, gloriously beautiful.

To secure such, you must order early. The name of Elliott's, bulb specialists for forty years, has always been a guarantee of the best. Full planting instructions with every shipment.

Giant Tulips---Special Offer Until July 1st

To be planted in the Fall. Bloom in May—stems over two feet tall. Flowers often 3½ inches in diameter. Ten varieties, superb in size, form and color.

BARRONNE DE LA TONNAYE. Vivid Pink.
BRONZE QUEEN. Buff and golden bronze.
CLARA BUTT. Delicate salmon pink.
DREAM. Lovely delicate lilac.
EUTERPE. Mauve-lavender. Extra fine.
FARNCOMBE SANDERS. Fiery scarlet.
PRIDE OF HAARLEM. Deep old rose.
FAUST. Velvety maroon-purple.
GLOW. Deep glowing vermilion.
MADAME KRELAGE. Pink, light bordered.

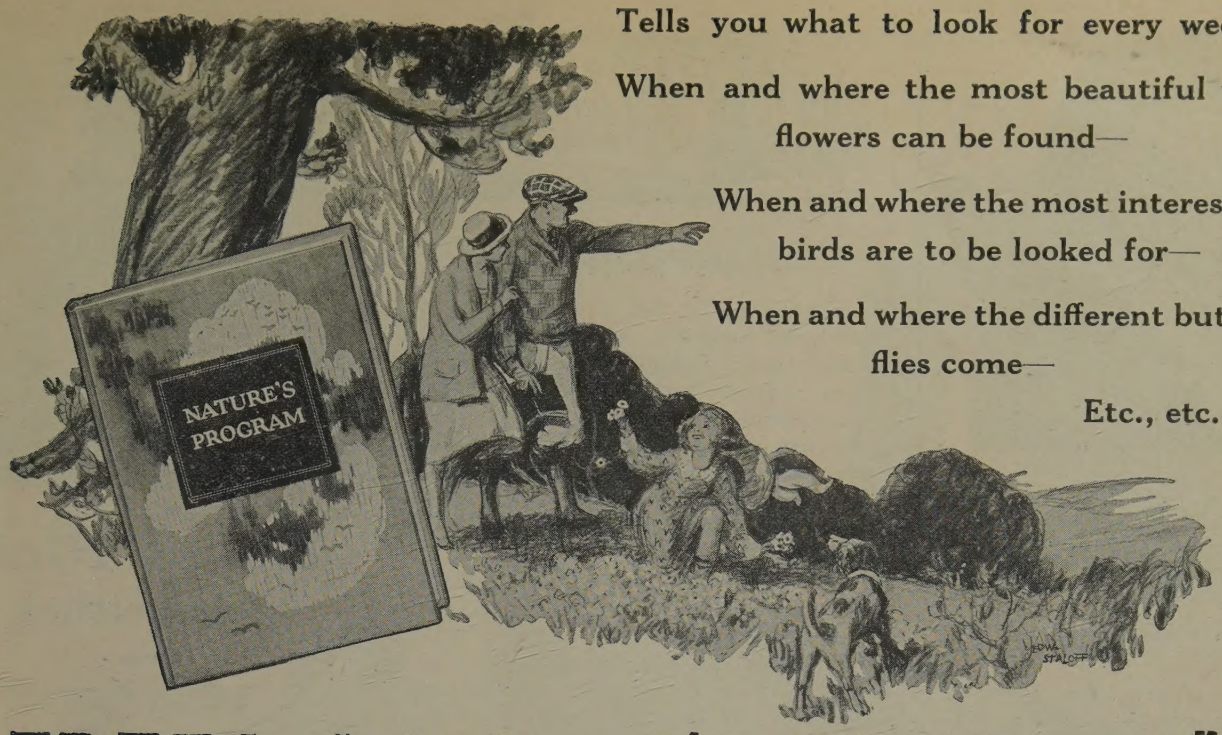
Collection A---100 Bulbs, 10 each kind . . . $4.95

Collection B, 250 bulbs, 25 each kind, $12.00. Collection C, 1000 bulbs, 100 each kind, $45.75.

Order now. Pay in the Fall when bulbs arrive or take 5% discount for cash with order. Safe arrival guaranteed. Late orders are liable to disappointment.

FREE Elliott's Book of Bulbs for 1926. Very helpful. Hundreds of practical suggestions for growing Tulips, Hyacinths, Daffodils, Lilies, and other bulbs, indoors or out. Profuse illustrations—many in natural colors. Send for it today. Place bulb orders early.

ELLIOTT NURSERY COMPANY, 629 Magee Bldg., Pittsburgh, Pa.



Tells you what to look for every week—

When and where the most beautiful wild flowers can be found—

When and where the most interesting birds are to be looked for—

When and where the different butterflies come—

Etc., etc.

FREE! ~ "NATURE'S PROGRAM"

A week-by-week guide to Nature's secrets

HOW disappointing it is not to know when the first bluebird is due! What a loss it is never to see a flying squirrel in full flight! How angry we are when we come upon some of the most beautiful wild flowers only when they have dropped their blossoms for the plain, matter-of-fact seed.

Perhaps you have often experienced this sensation *of being too late*. Perhaps you have despaired of ever coming upon some of the most fascinating of Nature's wonders. Perhaps some of your pleasure has been robbed because you never knew when and where to find the objects of your search.

Then you can imagine what a rare delight "Nature's Program" will be for you. Here is a book all nature-lovers have wanted; a book that is a week-by-week guide to Nature. From week to week this unique book will tell you *what* to look for each day, *where* to seek it, *when* to find it.

What's on the Program Now

For example: Suppose you start out right now, what can you find? What wild flowers are in bloom? What birds are to be seen and where? What are the animals doing? Turn to the present month in "Nature's Program." There you will learn exactly what you can expect to find, *and where to look for it.*

This practical guide, however, not only can be referred to by dates, but by subjects. Suppose, for instance, you want to know when and where the Wake Robin can be found. Or suppose your little boy finds a velvety black caterpillar which will later become a Painted Beauty and wishes to know when this glorious creature will emerge from its chrysalis.

Turn to the index of "Nature's Program," and find the creature or plant or flower you wish to know about. All the important plants, flowers, birds, animals, and butterflies are included. The index refers you back to the proper place in the dated guide, where you will find exactly the information you seek.

Sent to You Free

This wonderful book which can add so much to your pleasure will be—GIVEN TO YOU FREE! Simply write your name and address on the coupon below, and enclose 25c for postage and packing.

Why is this offer made? Because for years we have been foremost in the publication of books of Nature. We want to reach Nature-lovers in order to keep them informed of new Nature books as they appear. So, to learn who they are, we ask all lovers of the fields and woods to send us their names and addresses. For this courtesy we will send them a copy of "Nature's Program," this invaluable all-year-round guide to Nature's secrets.

Mail the coupon now, before you forget to do so.

NELSON DOUBLEDAY, INC. DEPT. L-805, GARDEN CITY, N. Y.

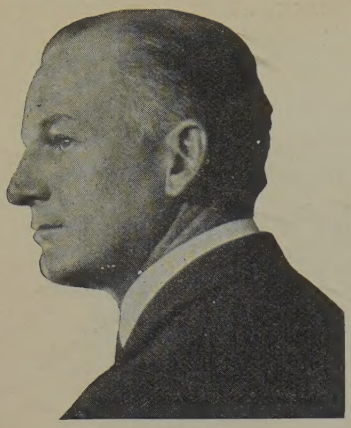
Nelson Doubleday, Inc.
Dept. L-805, Garden City, N. Y.

Please send me a copy of "Nature's Program," bound in cloth, a daily guide to Nature's secrets and wonders. I enclose 25c to pay for the postage and packing.

Name_____

Address_____

City_____ State_____



Nature Entertainments

Illustrated by

AUTOCHROMES (DIRECT COLOR-PHOTOGRAPHS), MOTION PICTURES, HAND-PAINTED SLIDES

Programs now available—Trees, Birds, Flowers, Rocky Mountain National Park, Bird Songs and Wild Flowers, Trees and the Woods-folk, Autochrome Studies.

Imitation bird calls by natural whistling

"The exactness of the imitations was astonishing."—*Pueblo (Colo.) Star-Journal.*

GUY C. CALDWELL
(Of the American Nature Association)

Official Guide in the Rocky Mountain National Park

"We were so delighted with your lecture in February last that we desire to have you again."
Wm. G. Lightfoot, Canandaigua Bird Club and Botanical Society.

For terms and open dates write direct to
1214 16th STREET, WASHINGTON, D. C.

Next summer Mr. Caldwell will take a limited number of boys at the Long's Peak Trail School, Long's Peak, Colo.

Reptiles, Amphibians

There is a great deal of unnecessary and unfounded antipathy, even among Nature lovers, toward reptiles. Much of this rests upon a pedestal of ignorance, misinformation and inhibition. To combat it there have been few popular reptile books that the layman understand and enjoy, notably among these Dr. Ditmar's fine work now obtainable only by much shopping around in second-hand book shops.

Comes, then, at a fortunate moment *Reptiles and Amphibians* from the press of Houghton Mifflin Company of Boston and from the pen of none other than Thomas Barbour, Curator of Reptiles and Amphibians in the Museum of Comparative Zoology at Harvard College. In this volume, beautifully and thoroughly illustrated, Dr. Barbour successfully turns his hand to popular writing. He gives us an entertaining discussion and not a treatise. He has endeavored to answer the questions most often asked; to combat the superstitions most frequently held. He has not designed a complete textbook on herpetology but opens the door to enjoyable reading about some of the remarkable facts of the reptilian world. The sale price of the book is $3.50.

American Nature Association

Announces

A wonderful new series of lectures for the season 1926-1927

by WILLIAM L. FINLEY

based on the expedition of the Association now starting for Wild Animal Outposts in the Bering Sea and the Kenai Peninsula of Alaska

Sea birds, seals, foxes, bears and all the magic of the great Northland

For terms and dates for the season 1926-1927 write to

Extension Department

AMERICAN NATURE ASSOCIATION
15 Boudinot St. Princeton, N. J.

Membership Nomination Blank

American Nature Association Washington, D. C.

ANNUAL DUES
United States $3.00 a year
Canada . . . $3.50 a year
Abroad . . . $4.00 a year

----------, 1926

Secretary, American Nature Association,
1214 16th St., Washington, D. C.

I nominate for subscribing membership in the Association and to receive NATURE MAGAZINE:

Address ---

Name and address of
Nominating Member ---

90% of the annual dues is designated for subscription to the magazine

"To him who in the love of NATURE holds communion with her visible forms"—

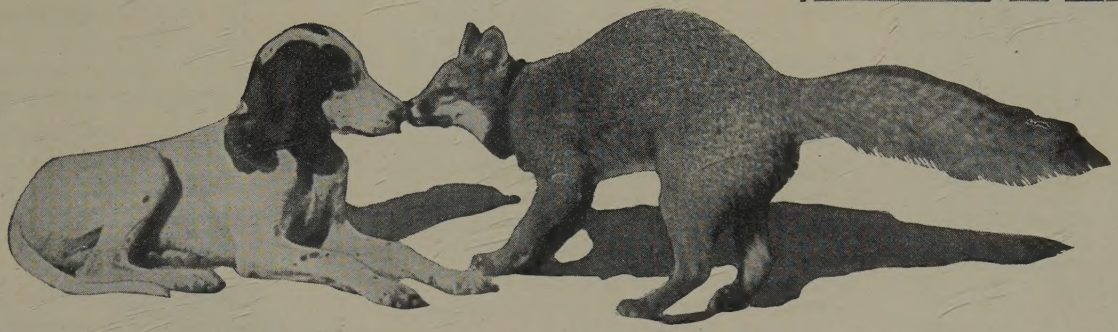
There are a thousand uses for

The **Filmo** *Automatic*

REGISTERED

World's Highest Quality

Motion Picture Camera



Unusual Sweethearts—Foxhound and Fox

YOU are reading this Magazine because the beauties and mysteries of Nature hold enchantment for you. You thrill as a humming-bird poses above a flower and daintily dips for its sip of honey. To you each member of the animal kingdom is just as individual as any of the "humans" you know.

Filmo is compact, light, easy to carry. Note the spy-glass view-finder — a distinctive feature originated and used exclusively by this company

Yet, your communions with Nature ordinarily have been restricted to the leisure moments you can spend in the open. Now with the FILMO Motion Picture Camera, you can bring them back with you, right into your living room at home, for a lifetime of enjoyment.

Anyone who can take an ordinary snapshot can take motion pictures with FILMO. Simply raise the camera to the eye, like you would sight a spy-glass. The picture is seen in the finder just as you want to take it—right side up and straight before you. Then touch the button and you get, automatically, motion pictures as sharp and clear as those you see in the better theatres.

These results are assured you because Bell & Howell Company, makers of FILMO, supply 95% of the professional cameras and equipment used in making motion pictures all over the world. The Filmo camera brings you the precision and flexibility of our professional cameras costing up to $5000.00. Yet its cost is but $180. It requires no tripod, no cranking, no adjustment or focusing for distance.

Ask the dealer in highest quality merchandise in your city to show you how personal movies are made and shown with the Filmo automatic Camera and Projector. Write us for descriptive Booklet, "What You See, You Get," telling the whole interesting story.

BELL & HOWELL CO.

1800 Larchmont Ave., CHICAGO, ILL.

Branches: New York, Hollywood and London

Manufacturers of 95% of the Professional Cameras and Equipment in Use the world Over

Established 1907

Provide for Year Round Comfort NOW

Install Chamberlin Metal Weather Strips

YOUR home needs Chamberlin Metal Weather Strips and Inside Door Bottoms—and now is a good time to install them. Chamberlin Metal Weather Strips will cut 20 to 40% off your next winter's and every succeeding winter's fuel bills. They will safeguard the health of your family by shutting out the cold, dangerous draughts that blow in around doors and windows—they will save you money and annoyance by keeping out the dust, rain and soot that depreciate your draperies and furnishings. Chamberlin Inside Door Bottoms are equally valuable. They will seal inside doors so that cold night air from bedrooms can't penetrate throughout the house—keep dust out of clothes closets—and confine kitchen and laundry odors where they belong.

Lifetime Guarantee

Chamberlin assumes full responsibility for installing all Chamberlin equipment and gives a lifetime guarantee both for the product and the result.

Return coupon for information

CHAMBERLIN
METAL WEATHER STRIP CO.
West Lafayette Blvd., Detroit, Mich.

100 Sales and Service Branches throughout the United States

CHAMBERLIN METAL WEATHER STRIPS
"SINCE 1893-THE STANDARD"

Chamberlin Metal Weather Strip Co.
West Lafayette Blvd., Detroit, Mich.

Please send me literature on Chamberlin Metal Weather Strips and Inside Door Bottoms. Also send me an approximate estimate for weather stripping my home

which has----------windows and----------doors.

Name _____

Address _____

City _____ State _____ FC-68

About Aquariums

Although the goldfish bowl on the stand by the window is only a small aquarium, it testifies to the owner's interest in the fish that swim in the sea. Those possessed of such interest will find much that is entertaining in *The Aquarium Book* written by E. G. Boulenger, Director of the Aquarium of the Zoological Society of London. It is from the press of D. Appleton and Company of New York. The author discusses in an entertaining and simple vein the problems of a custodian of many forms of sea life gathered into aquaria. He proceeds to equally attractive writing about the various individuals of his group of charges. The volume is excellently illustrated.

South American Birds

There comes from the presses of the Government Printing Office a distinct addition to ornithological literature of scientific significance in *Observations on the Birds of Argentina, Paraguay, Uruguay and Chile* by Alexander Wetmore, Assistant Secretary of the Smithsonian Institution. The book is one of 448 pages, is published as the Institution's Bulletin 133 and copies are available from the Government Printing Office, Superintendent of Documents, at 65c a copy.

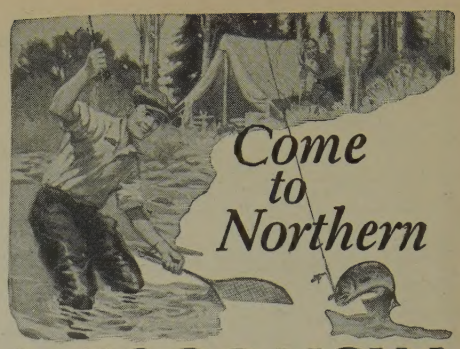
Dr. Wetmore's work sheds interesting light on the value of the Federal Migratory Bird Treaty, dealing as it does with many birds that have migrated south for the winter. Combined with these observations, which were concerned largely with shore birds, there was opportunity to collect native birds and to gather new information on their lives and habits.

Biology Quarterly

With the new year a new periodical of scientific character entered the field in the form of the *Quarterly Review of Biology*, published by Williams and Wilkins Company of Baltimore. The editor is Raymond Pearl of Johns Hopkins University with R. W. Hegner of the same institution as associate editor.

Garden Aristocrats

According to the blurb *Aristocrats of the Garden* answers the perennial question: What is best in plants? It does. A beautiful new edition of this volume by Ernest H. Wilson comes from the publishing offices of the Stratford Company of Boston to enter the lists for favor as the garden lovers' Bible. It treats with the origin and history, peculiarities and propagation of those aristocratic members of garden society that all garden lovers would like to see growing in their own gardens. In the new edition there are found much new data and improved advice. The book sells for $5.



WISCONSIN

for the time of your life

To the Great North Woods where the tang of the balsam fills the air. 7000 lakes abounding with fish. Bathing, canoeing, golfing, camping, hiking mid the fragrant pines. Bracing climate invigorating to mind and body—you'll gain a new conception of the joy of living after an outdoor vacation in the glorious North Woods.

CHICAGO AND NORTH WESTERN LINE

235

Bargain Summer Fares

Send for map folder and full information about North Woods resorts and summer homes.

C. A. CAIRNS, P.T.M.
233 S. Franklin St.
Chicago

CHICAGO & NORTH WESTERN RY.

Be a Taxidermist
Learn by Mail

Learn to mount all kinds of game, birds, animals, fish—tan furs, make rugs, robes, etc. **You can now learn this fascinating art in your own home during your spare time.** The lessons are interesting and easy to understand. Great sport and lots of fun. Big money for your spare time.

Mount Your Own Specimens

Decorate your home with beautiful specimens that you have caught and mounted yourself. **You can make big money** doing the work for others. Many specimens are becoming very rare and sell for high prices. Over 75,000 students have learned taxidermy through our lessons. One student writes us: "I have made over $550.00 during my spare time selling my specimens and mounting for others". We have thousands of similar letters.

FREE Beautifully illustrated book "How to Mount Game". Explains the secrets of taxidermy. Contains dozens of photos of mounted specimens. **Every hunter or trapper should have this book** Tells you how you can learn this fascinating art easily and quickly from our school. Sent you absolutely free. **No obligation.** Just send name and address. **Write today!**

Northwestern School of Taxidermy 1455 Elwood Bldg., Omaha, Nebr.

Paddling Your Canoe

There need be fewer fatal canoe upsets if boys and girls and men and women will study the technique of canoeing with sail or paddle, on lake or in river rapids. We have myriad books on how to cure a slice and how to improve your backhand but we have never before come across a really good book that would supply us with assurance when the fellow in the stern of the canoe decides to climb up forward to get his pipe. We have discovered it now in *The Boys' Book of Canoeing,* which Elon Jessup wrote, Charles E. Cartwright illustrated and E. P. Dutton and Company of 681 Fifth Avenue have just published. It lets one in on the tricks of canoeing safely, the idiosyncrasies of the single and double paddle and the sail, the care and repair of canoes and a lot more practical information. It looks to us like a good two dollars' worth of peace of mind when a'paddle.

Landscape Architecture

Although its pages are largely designed for the practicing landscape architect and planner, *Landscape Architecture,* the quarterly official organ of the American Society of Landscape Architects, contains much that is suggestive to the estate owner. It numbers among its contributors men who are leaders in the field and is most attractively illustrated and printed. Its office is at 9 Park Square, Boston, Mass.

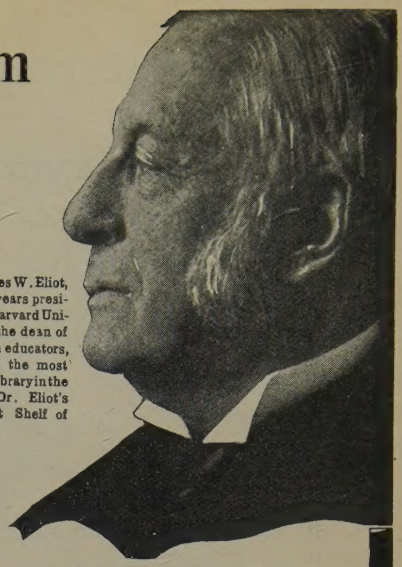
About the Magazines

An interesting idea is the basis of a comparatively new entrant to the magazine field, *The Magazine World.* It seeks to present complete some of the better things appearing currently in the better magazines and to serve as a guide to this important field of our contemporary literature. This little monthly is attractively printed and is edited by Donald B. Snyder. Its publication office is at 8 Arlington Street, Boston, Massachusetts.

Book of Rural Life

"The first comprehensive country-minded work," is the description that its publishers, Bellows-Durham Company, 104 South Michigan Avenue, Chicago, give to *The Book of Rural Life.* It is not one book but ten, totaling 6,200 pages with 8,500 titles alphabetically arranged and cross-indexed. It is illustrated with 6,000 text half-tones and line-drawings and 100 colored plates. The writers who have cooperated in the making of this volume include the leading specialists of our country in their various fields, which cover agriculture, home economics, health, education, civics and business and science. Dr. Harry C. Oberholser, member of the Scientific Consulting Board of NATURE MAGAZINE, and Prof. E. Laurence Palmer, director of Nature Education of NATURE MAGAZINE, are among the contributors.

Your reading problem solved by Dr. Eliot of Harvard



Dr. Charles W. Eliot, for forty years president of Harvard University, the dean of American educators, Editor of the most famous library in the world, "Dr. Eliot's Five-Foot Shelf of Books."

THERE will be a dozen competitors for your big opportunity when it comes. What will influence the man who is to make the decision among them?

"In every department in practical life," said ex-President Hadley of Yale, "executives have told me that they want from our colleges men who have *the power of using books efficiently.*"

Not book-worms; not men who have read all kinds of books. Not men who have wasted their time with newspapers. But those who have mastered the few great books that make men think clearly and talk well.

What are those books? A free booklet answers those questions; it describes

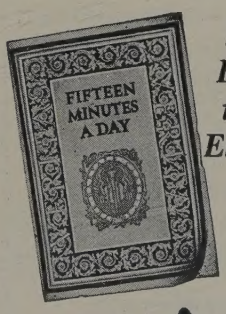
Dr. Eliot's Five-Foot Shelf of Books

Every well-informed man and woman should know something about this famous library.

The free book tells about it—how Dr. Eliot has put into his Five-Foot Shelf "the essentials of a liberal education," how even "fifteen minutes a day" can be enough, how by using the reading courses you can get the knowledge of literature and life, the culture, the broad viewpoint that every university strives to give.

You can enjoy these good books while you are paying for them. P. F. Collier & Son Company since 1875, have brought good books within reach of all. Act today!

Every reader of this column is invited to have a copy of this handsome little book. It is free. Clip the coupon and mail it today.



Send for this FREE Booklet that gives Dr. Eliot's own plan of reading

P. F. COLLIER & SON COMPANY
250 Park Ave., New York City

By mail, free, send me the little guide book to the most famous books in the world, describing Dr. Eliot's Five-Foot Shelf of Books, and containing the plan of reading recommended by Dr. Eliot of Harvard. Also please advise how I may secure the books by small monthly payments.

Name {Mr. / Mrs. / Miss} .....

Address .....

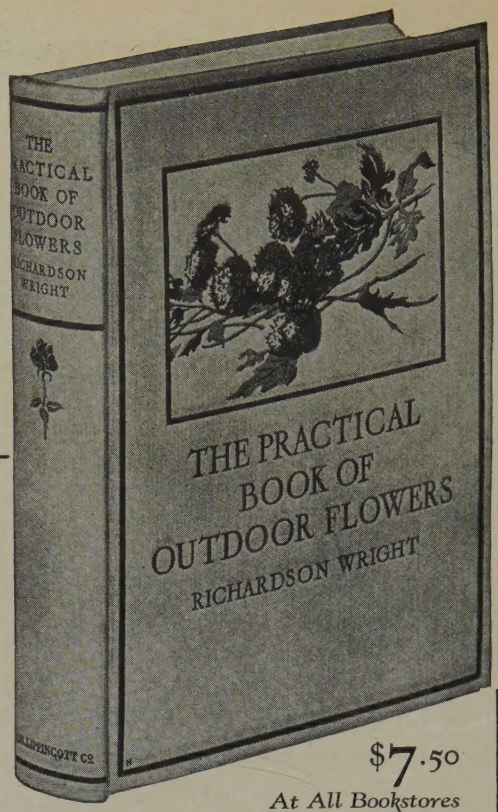
4269-HCGK-L

The publisher cannot undertake to send the booklet to children.

If you want your garden to be lovelier than ever this year—

Get this Book

and plan all the things you've always wanted to do



9 COLOR PLATES

165 DOUBLETONE ILLUSTRATIONS

A magnificently illustrated and instructive guide for those who plan or supervise their own planting—an inspiration to the growing of better flowers and the making of more beautiful gardens. Covers every particular in the preparation and laying out of flower beds and shrubbery with suggestions and information for both the beginning and the practiced gardener. The various idiosyncrasies of perennials, annuals, bulbs, flowering trees, shrubs and vines are considered with the treatment that will induce healthy and abundant bloom. There are fascinating schemes of color combinations in plot and borders, plans for rock gardening and wall gardening, arrangements for fragrance and old-fashioned design. In fact, it is the most comprehensive work on the subject ever published as well as the most beautiful. It will become the standard for all lovers of gardens and gardening.

$7.50

At All Bookstores

J. B. LIPPINCOTT CO. 227 So. 6th, *Dept. N5*, Philadelphia

Please send me illustrated pamphlet of this book and other similar volumes.

.....

.....

Wonderful Nature Paintings

By

R. BRUCE HORSFALL

$1.00 for Set of 12

FULL COLOR REPRODUCTIONS

Each size 9 x 12

Mailed flat. Printed on Heavy Paper

Special discounts for quantity orders from schools, colleges, libraries, etc.

The subjects are:

The Humming-Bird	The Elk
The Jaguar	The Gull
Great Blue Heron	The Blue Bird
Brown Bear	The Surf Scoter
Canada Geese	The Beaver
The Moose	The Junco

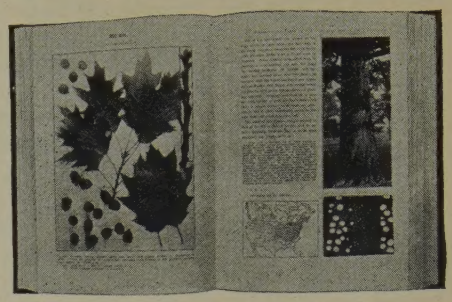
Send your order at once to

AMERICAN NATURE ASSOCIATION

1214 Sixteenth Street
WASHINGTON, D. C.

Hough's Handbook *of* Trees

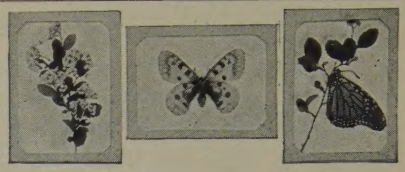
Is photo-descriptive and enables one to identify all of the trees east of the Rocky Mountains and north of the Gulf States at any season of the year. 891 illustrations.



The HANDBOOK opened at Red Oak. Two pages facing each other are devoted to a species. "Its illustrations almost carry the scent and touch of the original."—*New York Times.*

$8 and $10, according to binding

ROMEYN B. HOUGH COMPANY
Lowville, New York



Schwarz Handy Nature-Study Mount

Preserve & Protect your Insects, Plants and other Nature-Study Objects by using the Schwarz Handy Nature-Study Mount.

PRACTICAL & ECONOMICAL. WRITE FOR CIRCULAR

Midwest Nature-Study Supply House
1128 Washington Ave. St. Louis, Mo.

BOOKS on Birds, Insects, Fishes, Reptiles, Flowers, Gardening and General Natural History Bought and Sold.

Catalogues on application.

H. G. FIEDLER, 18 Vesey Street, New York

SEE PICTURESQUE AMERICA
By J. F. KANE
At your Library or Booksellers

Special Offer:
Select the two most attractive illustrations and send for special offer regarding them.

RESORTS AND PLAYGROUNDS OF AMERICA
51 East 42nd Street New York

BOSTON BIRD BOOK COMPANY

Eastern and Western and State Bird Books. Bird books of all sorts. Our Bird Houses are in the Massachusetts and Rhode Island Bird Sanctuaries, the Reservation of the N.E. Federation of Bird Clubs, Babson Park and on many estates. 90 cents each. 2 for $1.70. Mail orders only.

162 Boylston Street, Boston, Mass.

STUDY AT HOME
Directed by
The University of Chicago

Courses in English, History, Chemistry, Business, Mathematics, Education, Psychology, and 35 other subjects command credit toward a Bachelor degree. Begin any time. Address 33 Ellis Hall, University of Chicago, Chicago, Ill.

Short-Story Writing

One pupil won a $2000 prize. Another pupil earned over $5000 in spare time. Hundreds are selling constantly to leading publishers.

Particulars of Dr. Esenwein's famous forty-lesson course in writing and marketing of the Short-Story and sample copy of THE WRITER'S MONTHLY free. **Write today.**

The Home Correspondence School
Dr. ESENWEIN Dept. 51 Springfield, Mass.

Helpful References

Requests for citation of authoritative general works on various branches of Natural History are frequently received from our readers. The following list includes some of the best in their respective fields. Some are out of print and obtainable only through libraries or dealers. Other subjects and titles will be covered in future issues.

Mammals

AMERICAN ANIMALS. By Witmer Stone and W. E. Cram. Doubleday Page & Co., Garden City, New York.

WILD ANIMALS OF NORTH AMERICA. By E. W. Nelson. National Geographic Society, 1918. $3.

LIFE HISTORIES OF NORTHERN ANIMALS. By Ernest Thompson Seton. Two volumes, 1,267 pages. Charles Scribner's Sons, New York, 1907. $18.

Birds

KEY TO NORTH AMERICAN BIRDS. (With chapters on general and field ornithology). By Elliott Coues. Fifth edition, 2 vols. Dana Estes & Co., Boston, 1903.

HANDBOOK OF BIRDS OF EASTERN NORTH AMERICA. By Frank M. Chapman. D. Appleton & Co., New York. $4.

HANDBOOK OF BIRDS OF WESTERN UNITED STATES. By Florence M. Bailey. Houghton, Mifflin & Company, Boston, Mass. $6.

BIRD GUIDE. By C. A. Reed. Part 1, Water and Game Birds; Birds of Prey East of Rockies. Part 2, Land Birds East of Rockies. Illustrated in color. Doubleday, Page & Co., Garden City, New York. Per part, cloth, $1.25.

LAND BIRDS WEST OF ROCKIES. By C. A. Reed. Illustrations in color. Doubleday, Page & Co., Garden City, New York. $1.75.

FIFTY COMMON BIRDS OF FARM AND ORCHARD. Agriculture Farmers' Bulletin 513. Colored illustrations. Sold by Supt. of Documents, Washington, D. C., for 15 cents (cash).

HOMES FOR BIRDS. By Kalmbach and McAtee. Farmers' Bulletin 1456. U. S. Dept. Agriculture. Sold by Supt. Documents, Washington, D. C., for 5 cents (cash).

The Pennsylvania State Forest School
Established in 1903

Offers in addition to the four years' forestry course a six weeks' summer course of thirty half days' work in forest studies, forest botany and zoology. Facilities for advanced field and laboratory study for teachers of botany and zoology. For circular and further information, address:
E. A. Ziegler, Director, Mont Alto, Pennsylvania

Grand Canyon
National Park-Arizona

"There are not seven wonders of the world, or seventeen or two. There is only one and this is it. Come and see it."

Thus wrote Mr. Arthur Brisbane in his column "Today" in the Chicago Herald-Examiner of February 27, 1926

It is an unordinary vacation-land where days and weeks profitably may be spent.

There are trail trips into this color-canyon, to camps a vertical mile below earth's crust and from "rim to rim" and back.

There are motor trips through the pine forests to points revealing panoramas extending hundreds of miles and ablaze with rainbow tints; also to and through the picturesque Hopi and Navajo reservations.

Hotel and camps on the South rim and in the Canyon are under Fred Harvey management.

You can go this summer at very reasonable cost, account Santa Fe Xcursions to scenic regions of the west. Pullmans to the very brink.

You will want to know more. Mail this coupon

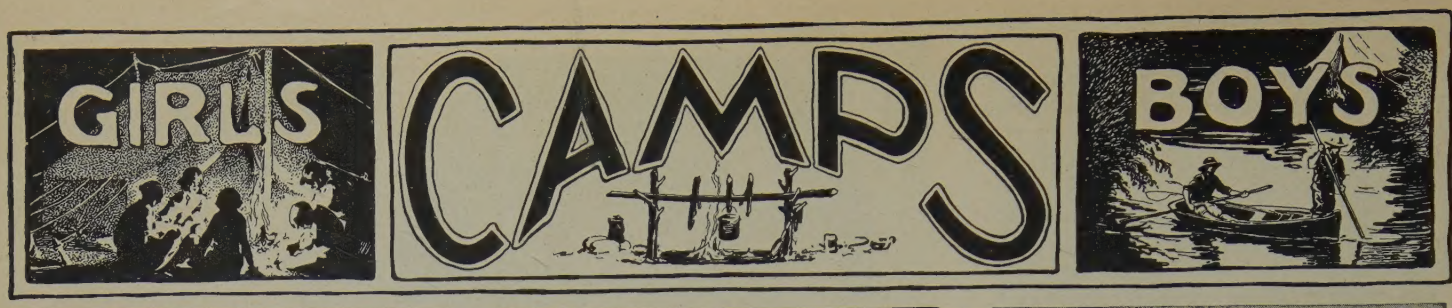
W. J. Black, Pass. Traf. Mgr., Santa Fe System, 1117 Railway Exchange, Chicago

Would like information regarding summer trip to.....

There will be.....persons in party. ☐ Indicate by X if Grade or High School student.
Also mail descriptive travel folders.

Name.....

Street No.....City and State.....



OGONTZ *White Mountain Camp for Girls*

Peace of limitless forests . . . Quiet of New Hampshire hills. . . . Lap of soft inland waters. . . . Spotted shade of forest paths. . . . Spell of life in the open. And under the spell, working with nature to develop grace and poise and self-expression. This the Ogontz holiday place in the White Mountains; these the surroundings where girls respond to the spell of the out-of-doors. No extra charge for riding. 560 acres. Golf. All sports. Cabins with electric lights and running water. Log Hall club for older girls. Write for catalog. **Ogontz School, Rydal, Pa.**

CAMP MARS HILL

ELEVENTH SEASON

The Ideal Camp for Girls

Nestled on the shores of a delightfully secluded lake, and in the midst of the picturesque Maine woods, 10 miles from Camden and Rockland, it offers healthy outdoor living, wholesome food in abundance, and a happy and contented community life.

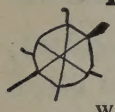
Land and Water Sports
Music Dramatics Crafts

Let your daughter enjoy her summer vacation, away from the heat and monotony of the city. Reservations now being made for the season. Ages 10 to 18 years.

For booklet and complete information address,

MISS FLORENCE T. LITTLEHALES
205 West 94th Street — New York City
After June 1, Union, Maine

Camp Mishike *"The Turtle"*



In the heart of the North Woods, Mishike, Wisconsin. Definite program of forestry, under trained foresters. Canoeing, exploring, marking trails, learning woods lore. Every day an adventure. 1700 acres. Four miles lake shore. Write for booklet.

W. E. SANDERSON, *Director*
18 East 41st Street — New York City

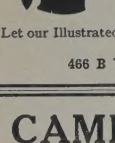
Pinnacle

BOYS CAMP OF QUALITY LYME N.H.

Unusual advantages in camp training. Every boy is instructed in and benefits from each activity. **Manual Training, Nature Study, Scoutcraft, Photography. All land and water sports.**

10th Season. For Booklets address

MR. & MRS. A. D. THAYER, LYME, N. H.



CAMP SAMOSET, Lake Winnepesaukee, N. H.

Junior and senior camp for boys, 12th season. Best of Fun. Best of Food. Best of Care. Mature counsellors who know and love boys. All sports, Horseback riding, Canoe cruising, Riflery. Three fine Clay Tennis Courts. Nature study and woodcraft featured.

Let our Illustrated Booklet tell the story.

THOMAS E. FREEMAN
466 B Waltham St., West Newton, Mass.

CAMP LOYALSOCK

An exceptional Camp for 40 Christian boys, near Williamsport. 5th season. July 1st-Aug. 27th. All inclusive fee $200. All land and water sports, zoo, hut building, special trips, trained leaders.

For booklet address

Mr. and Mrs. L. E. Klepper — Montoursville, Pa.

CAMP OSOHA

TROUT LAKE, WIS. An exceptional camp for a limited number of selected girls. Individual attention, screened bungalows, excellent food, arts and crafts, land and water sports, dramatics, dancing, tutoring, over-night trips. References required. Sixth season, Booklet. **Mr. and Mrs. Robert Snaddon. Richland Center, Wis.**

Send the Boy to the Rockies

In June a limited number of boys will be taken at the

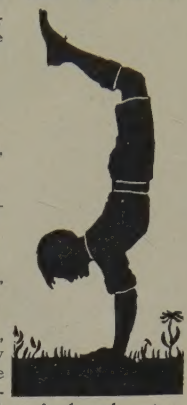
ROCKY MOUNTAIN NATURE CAMP
(on the Long's Peak Trail)

P. O., Long's Peak, Colo.

Guy C. Caldwell, Director, Guide in the Rocky Mt. National Park

Howard H. Cleaves, Instructor, now on staff of State Museum, Albany, New York

Dean Babcock, Instructor, Artist, Naturalist, Wood Carver



Mountaineering, Fishing, Swimming, Photography (Movies and Stills), Nature Study (Beaver, Bear, Bighorn Sheep, etc.). Excellent food and water. Elevation 9,000 feet.

Write for details to

GUY C. CALDWELL
1214 16th Street — Washington, D. C.

THE TOLTECS

TOLTEC HILLS
WESTON, CONNECTICUT
FOR THIRTY BOYS
AGES EIGHT TO SIXTEEN
SIXTH SEASON
JUNE 30TH TO SEPTEMBER 1ST, 1926

Wallace Greene Arnold, Director
1275 Lexington Ave., New York

PINE TREE CAMP FOR GIRLS

On beautiful Naomi Lake 2,000 feet above sea, in pine-laden air of Pocono Mountains. Four hours from New York and Philadelphia. Experienced councilors. Horseback riding, tennis, baseball, canoeing, "hikes." Handicrafts, gardening. 15th year.

MISS BLANCHE A. PRICE
404 W. School Lane, Philadelphia, Pennsylvania

BEARTOOTH RANCH

"in the heart of the Rockies"

A camp characteristic of the Great West. Membership limited to Twenty Boys. Twenty-one day horseback trip to Grasshopper Glacier, Cooke City, and through **Yellowstone Park** over the unbeaten trail. Intensive physical training, horsemanship, roping, mountain hiking. **Illustrated Booklet.**

EDWARD J. IKERMAN, Director
Dean, Montana

CAMP WAKE ROBIN

Catskill Mts. — Woodland — N. Y.

YOUNG BOYS EXCLUSIVELY

Twenty-second season. Nature-lore led by O. P. Medsger, Woodsy Camp. Four hours from New York City. Woodcraft, hiking, swimming, manual training, all sports. Modern sanitation. Booklet. H. L. LITTLE, Lincoln High School, Jersey City, N. J.

CAMP BAY STATE, TILTON N. H.

For boys 9-18. Trips to all points of interest in the White Mts. and Lakes in N. H. featured. Sports. Woodcraft Circle. Rifle Range. Nature-Study. Every boy learns to swim. 8 weeks, $200.00. Write for booklet.

M. M. BALLAM
28 Peirce Street — Arlington Heights, Mass.

OSOHA-of-the-DUNES A NATURE CAMP FOR GIRLS

On Crystal Lake, Frankfort, Michigan

Lodges and sleeping cabins, screened; Modern sanitation; staff, fifteen college women, resident nurse, dietician; supervised athletics, land and water sports, swimming, canoeing, sailing, riding; beautiful woods and water front. Nature study, indoor crafts, dramatics, folk dancing. Near dunes and shore of Lake Michigan. Moderate tuition. Seniors, teen age; Juniors, 8 to 12. Booklet on request. Sixth season, July 1 to August 26.

Mrs. B. G. MATTSON, Director, Charlevoix, Mich.

CAMP CHESAPEAKE

FOR BOYS

On Mobjack Bay, an arm of the Chesapeake, Gloucester County, Virginia

Salt Water, Ideal Cruising, Fine Fishing, Wonderful Climate, Baseball, Football, Basketball, Riding

This camp is under the direction of Dr. Blair Spencer, child specialist, a former Director of Public Health of Philadelphia, assisted by athletic instructors and navigators.

Just the place for boys who love an active outdoor life on land and water.

Season—July 1 to September 1. Fee $350. No extras

Write for Catalogue

BLAIR SPENCER, M.D., Zanoni, Virginia

CAMP POCONO for boys 9-18 Seventh Season

In the Poconos on a private Lake 100 miles from Philadelphia or New York.

All sports and unlimited horseback riding included in fee of $275.00. Delaware River Canoe Trip. Excellent food. Resident physician. Careful supervision. Character building.

MR. and MRS. C. N. PAXSON
113 Kenilworth Road — Narberth, Pa.

Olde Mille Lodge

A camp for the small boy. Ages, 7-14. 45 miles from Phila. on French Creek, Chester County, Pa. Among Welsh Mts. All sports under careful supervision. Cabins.

References required. Send for booklet.

DR. ROY KERR ELDRIDGE
Upper Darby Br. — Philadelphia, Pa.

CAMP MARANACOOK

Box 32, Readfield, Maine

For boys, 7 to 17
Seventeenth season.
Excellent table.

Strong camp council of mature and experienced men. One of the best equipped camps in America. Carefully planned daily programme. Canoe and mountain trips for all. Booklet.

William H. Morgan, Director.

Briggs Camps—Northfield, Mass., and Winchester, N.H.

Quinneh Tuk for Boys. Pachaug Camp for Girls. Land and water sports; ponies and riding horses; over-night nature hikes; Indian powwows; camp fires; camera hunting; abundant table; moderate rates—no extras; Mirimichi Family Camp with special provision for children; auto tourist camp; over-night porches; cottages and tents; golf available. Booklet.

Mr. and Mrs. Howard Briggs, Squakheag, Northfield, Mass.

Camp Naidni

Lake Dunmore, Vt. For Girls 8-21. Wholesome vacation camp, 50 acres. ½ mile lake front. Swimming, Canoeing, Hikes, Gypsy Trips, Healthful food. Personal supervision. $200 season. For information apply to:

MRS. G. C. BRITTEN, Tel. Mt. Kisco 177.
New York, Mt. Kisco, St. Marks Place.

In The Kennels

"Strong Heart" Police Dogs

Champion Bero of Elmview

"Character plus Appearance." You can pay more but you *can't* get a better dog.

SUN BEAM FARM
STRONG HEART KENNELS
R. F. D. 10
New Brunswick
New Jersey

GREAT DANES

of unusual size and intelligence. Plenty of pups on hand. Immediate delivery assured. Enclose fifteen cents for catalog.

COLLINS KENNELS
Box 461 Reedsburg, Wisconsin

RUSSIAN WOLFHOUND PUPPIES

bred from the very best imported strains. Puppies ready for shipment.
Prices reasonable.
Catalogue Ten Cents
Arkansas Valley Kennels
D. C. DAVIS, Prop.
Dept. N, Cimarron, Kans

NOBLE NEWFOUNDLAND PUPPIES

from the very best registered A. K. C. stock.
Prices reasonable
KENNEBEC FUR RANCH
E. L. Moulton
Woolwich Maine

"I'm not afraid with my Von Abt dog"

In POLICE DOGS the name **Von Abt** gives assurance of loyalty, intelligence and stamina

THE VON ABT KENNELS
Mentor, Ohio
Desirable Puppies Now Available

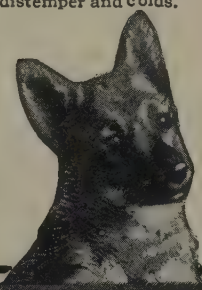
WHITE COLLIE PUPS—Rare and beautiful. Fine for farm and home. Thoroughbred pedigreed. Prices right. **MERIT KENNELS, Meltidge Camp, Henderson, Kentucky.**

DISTEMPER
—Watch Your Dog

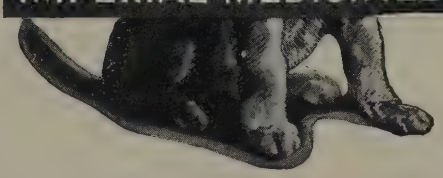
At the very first symptom of chills, discharge from eyes and loss of appetite give Glover's Imperial Distemper Medicine and continue for several days after all symptoms have disappeared.
This medicine is very effective in the treatment and prevention of distemper and colds.

Glover's Imperial Medicines for all dog ailments for sale at all Drug Stores, Pet Shops, Sporting Goods Stores.

Write for Free "Treatise on Dogs."
Address Dept. DW40
H. Clay Glover Co., Inc.
119 Fifth Avenue
New York City



GLOVER'S IMPERIAL MEDICINES



GERMAN POLICE, AIREDALES and COLLIE PUPPIES

Sale on this month. Will send C. O. D.
Order from this ad. Stock must be sold. All pedigreed. First-class condition.
Collies, males . . $10–$18 Airedales . . $10–$15
Police . . $25–$35
H. T. JOHNSON, Postmaster, Owner of Maplewood Kennels, Box 35, Medway, Mass.

"DOG AND BLACK FOX INSURANCE"

Policy Covers Death from Any Cause, Theft and Loss by Escape
LOWEST RATES
LLOYD'S NATIONAL UNDERWRITERS
PEORIA, ILLINOIS

INSURANCE

DOGS, CATS and FOXES
Real insurance at cost

Lloyd's Insurers

AMERICAN LLOYD'S, LTD.
Managers
Liberal Policy covering against Death, Theft, Escape and other Hazards. Do not delay—insure today.
Do not confuse us with any other Lloyd's organization
6 N. Michigan Ave. Dept. K. Chicago, Ill.

MASTER BUILT SANITARY KENNELS

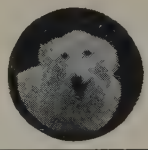
Make Happy, Healthy Dogs
May be cleaned, aired and sunned in a jiffy.
Four standard sizes or special sizes to order.
Best material and workmanship.
Send today for Circular "J"
Master Kennel Builders
Basking Ridge
New Jersey

COLLIE PUPS

that will bring joy to the kiddies. Handsome and healthy from the most noted prize-winning strains. Certified pedigrees. Reasonable prices.
Phone: Belmont 08-04-W
W. R. VAN DYKE
4841 Olive Street
Phila., Pa.

Did You Ever Look Into
SILVER FOX FARMING?

It is very profitable and the demand for fur is worldwide. A copy of the "SILVER FOX BREEDER MAGAZINE," 50 pages monthly, the "BEGINNERS" magazine, will be sent FREE on request. 229 Congress St., Boston, Mass.



WHITE COLLIE PUPS

The most beautiful specimens the dog world can offer. Home guards, loyal companions, useful and intelligent. Illustrated circulars free.
COMRADE FARMS
Galion Ohio

ADDITIONAL CAMP ADVERTISING

BREEZY RIDGE FARM FOR GIRLS 10-16 Years

Hiking, Sports, Nature Study a Specialty. Excellent food. Personal supervision. Grounds 150 acres. Limited enrollment. Particulars on request.
MRS. CLIFTON H. RICHIE
Franklin New Hampshire, R. F. D. 1

Inter Oaks Ozark Mountain Camp In Missouri FOR GIRLS

Land and water sports, archery, crafts, dancing, trips, woodlore. Wild and romantic setting. Enrollment 50. Screened open-air buildings, no tents. All camp comforts. Excellent food. $300. Fifth season. Booklet. **Jennie Fearn Curry, 3634 Hartford St., St. Louis, Mo.**

CAMP NEHANTIC *for* GIRLS

Mountain and Lake Region, Wayne Co., Pa. Elevation 2250 ft. Lake ownership. Junior, Intermediate and Senior camps. Horseback riding. Eighth year. July and August. $225.00. *Booklet.* Mr. and Mrs. Harry Davison, Box F, 5333 Rising Sun Ave., Phila., Pa.

OWAISSA

Camp of Happiness
2,000 ft. elevation on lake in Pocono Mountains. All camp activities. Tent-houses. Horses. Personal care for each girl. 11th year. *Booklet.*
DR. and MRS. O. H. PAXSON
6327 Lancaster Ave., Overbrook, Phila., Pa.

CAMP NEEWAH in the Berkshires

For girls 7 to 17. Swimming, boating, hiking, baseball, basketball, tennis, archery, fencing, dramatics, handcrafts, aesthetic dancing, horseback riding, golf instruction. Limited enrollment. 110 miles from New York. Write for Booklet. MRS. B. P. SCHMITT, Brooklyn, New York, 1723 E. 7th St., Dept. N.

NORRIDGEWOCK

A camp for thirty-five Boys 7-16. On Condon's Island (50 acres), East Lake, one of the Belgrade Lakes, Maine. Sixth season. Rate $300. Personal interviews gladly arranged.
ARTHUR M. CONDON, Director, Northampton, Mass.

TRAVEL CAMP

For boys 12-18 years—July and August
Educational Camping Tour to Yellowstone National Park. Write for folder.
L. SPELMAN, *Director*
Silver Bay Travel Camp
Silver Bay, on Lake George, N. Y.

CAMP WAMPHALLOBANK

FOR GIRLS 10-18 YEARS — OUTDOOR LIVING
160-acre Lily Lake — Real Camp Activities
1,000-foot elevation — $15 per week. Booklet
LORAINE BOYD, 158 S. Sherman St., Wilkes-Barre, Pa.

GIVE NATURE MAGAZINE
as a Birthday Present

American Nature Association

ORGANIZED TO STIMULATE PUBLIC INTEREST IN EVERY PHASE OF NATURE AND THE OUT-OF-DOORS, AND DEVOTED TO THE PRACTICAL CONSERVATION OF THE GREAT NATURAL RESOURCES OF AMERICA

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

Officers

ARTHUR NEWTON PACK
Princeton, N. J., President

CHARLES LATHROP PACK
Lakewood, N. J., Chairman
Board of Directors

PERCIVAL S. RIDSDALE
Washington, D. C., Secy.-Treas.

RICHARD W. WESTWOOD
Washington, D. C., Asst. Secy.

HARRY E. RADCLIFFE
Washington, D. C., Bus. Mgr.

Associates

WILLIAM L. FINLEY
Jennings Lodge, Ore.
Director, Wild Life Conservation

PROF. E. LAURENCE PALMER
Cornell University, New York
Director Nature Education

ANNA BOTSFORD COMSTOCK
Ithaca, N. Y.
Assoc. Director Nature Education

RUSSELL T. EDWARDS
Washington, D. C.
Director Educational Publicity

Scientific Consulting Board

DR. L. O. HOWARD
Chief of U.S. Bureau of Entomology

DR. HARRY C. OBERHOLSER
Biologist, U. S. Biological Survey

HENRY O'MALLEY
U. S. Commissioner of Fisheries

VERNON BAILEY
Chief Field Naturalist
U. S. Biological Survey

DR. PAUL BARTSCH
Curator of Mollusks
U. S. National Museum

C. W. GILMORE
Curator of Vertebrate Paleontology
U. S. National Museum

EDWARD A. PREBLE
Biologist, U. S. Biological Survey

DR. WALDO L. SCHMITT
Curator of Marine Invertebrates
U. S. National Museum

DR. EDGAR T. WHERRY
Wild Flower Preservation
Society of America

T. GILBERT PEARSON
New York City
National Association of
Audubon Societies

NATURE MAGAZINE

PERCIVAL S. RIDSDALE, Managing Editor
ARTHUR NEWTON PACK, Associate Editor
RICHARD W. WESTWOOD, Assistant Editor
EDWARD A. PREBLE, Consulting Naturalist
R. BRUCE HORSFALL, Artist

$3.00 a Year — 35c a Copy

TABLE OF CONTENTS

May, 1926

The Polar Bear	R. Bruce Horsfall	Cover
The Baron of Cowfoot Lake	Ben Hur Lampman	267
How a Feathered Architect Works	L. W. Brownell	271
When and How Far can a Rattlesnake Strike	Joseph Dixon	274
The Seventh Sleeper	Samuel Scoville, Jr.	275
The Harmonies of Nature-Sound	H. W. Shepheard-Walwyn	279
Trillium, or Wake-Robin	Albert A. Hansen	282
First Acquaintances at Dominica	Paul Griswold Howes	285
White Bruin of the North	Capt. Johan Menander	288
The Blood-Stained Cockatoo	Edward A. Preble	292
The Mourning Dove	Gayle Pickwell	293
Outdoor Good Manners	Mrs. Francis E. Whitley	296
The Rain Forests of the Tropics	Tom Gill	297
Trailing Nature	George T. Hastings	301
Some Interesting Things to See in May	E. Laurence Palmer	303
Game Refuges	William L. Finley	305
Life Histories of Some Common Birds	E. Laurence Palmer	306
Nature Education		307
Hydra—A Celestial Reptile	Isabel M. Lewis	308

SUBSCRIBING MEMBERSHIP BLANK WILL BE FOUND IN THE BACK PAGES OF THE MAGAZINE

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter, March 4, 1924, at the Post Office at Washington, D. C., under the Act of March 3, 1879

Copyright, 1925, by American Nature Association

Publication and Editorial Office, 1214 16th Street, Washington, D. C.
Western Office, 122 Michigan Boulevard, Chicago
Eastern Office, 171 Madison Ave., New York City

NATURE CALENDAR

HIGH SCHOOL LIBRARY
MAYWOOD, ILL.

MAY

The May woods are as colorful as in autumn except more delicate shades prevail. Pinks, yellows, lavenders, blues and bright greens dominate.

Big, greenish-yellow flowers, dashed with red, sit erect upon the branches of the tulip tree, one of the largest and most beautiful of our native trees.

Long, green catkins, like fringes of chenille, hang from the shagbark hickory.

The irregular, twisted branches of the locust are hiding beneath the beauty of their leaves and fragrant flowers. The peculiar habit of the leaflets, which fold together at night, led a child to say, "It is not bed time; the locust tree has not begun to pray."

Pussy willow trees are shaking forth tiny seeds, each equipped with a fluffy silken parachute.

The flowers of mountain laurel have an interesting device for showering insects with pollen. Let your finger be an insect seeking nectar in the center of the flower and watch how the ten little stamens fly up from their pockets and scatter pollen.

Blue flags raise high their flowers above the tall meadow grasses.

The superb flowers of the stately horse-chestnut render it "a sight for Gods and men."

May is the time to observe the domestic habits of birds. More than eighty different species are nesting this month.

Bob-whites raise large families. Twelve or more eggs may be found in their grassy nests. The first of their two or three broods is now in incubation.

Many an old flicker's hole contains blind, naked squirrel babies.

South Wind

"Where have you been, South Wind, this May-day morning,
With larks aloft, or skimming with the swallows,
Or with blackbirds in a green, sun-glinted thicket?

Oh, I heard you like a tyrant in the valley;
Your ruffian hosts shook the young, blossoming orchards;
You clapped rude hands, hallooing round the chimney,
And white your pennons streamed along the river.

You have robbed the bee, South Wind, in your adventure,
Blustering with gentle flowers; but I forgave you
When you stole to me shyly with scent of hawthorn."

—Siegfried Sassoon.

The doe has dropped her winter coat and donned her sleek, spring garment. The middle of the month will find her in some sheltered thicket with her young.

The first of May witnesses the birth of young porcupines. These mammals are unusually big at birth, being larger than newborn blackbears.

Pond bottoms, illuminated by rays of the sun, reveal many interesting creatures. Here you may see brown tadpoles with vigorously waving tails, caddis fly larvae carrying their log houses, and maybe some back-swimmers either coming down with a supply of air or going to the surface for more.

Little companies of blue-black whirligig beetles circle on the surfaces of ponds or still pools.

Our amphibian acrobat, the common tree frog, is now splashing about the waters of the ponds, where you may hear his singing mingled with that of the cricket frog.

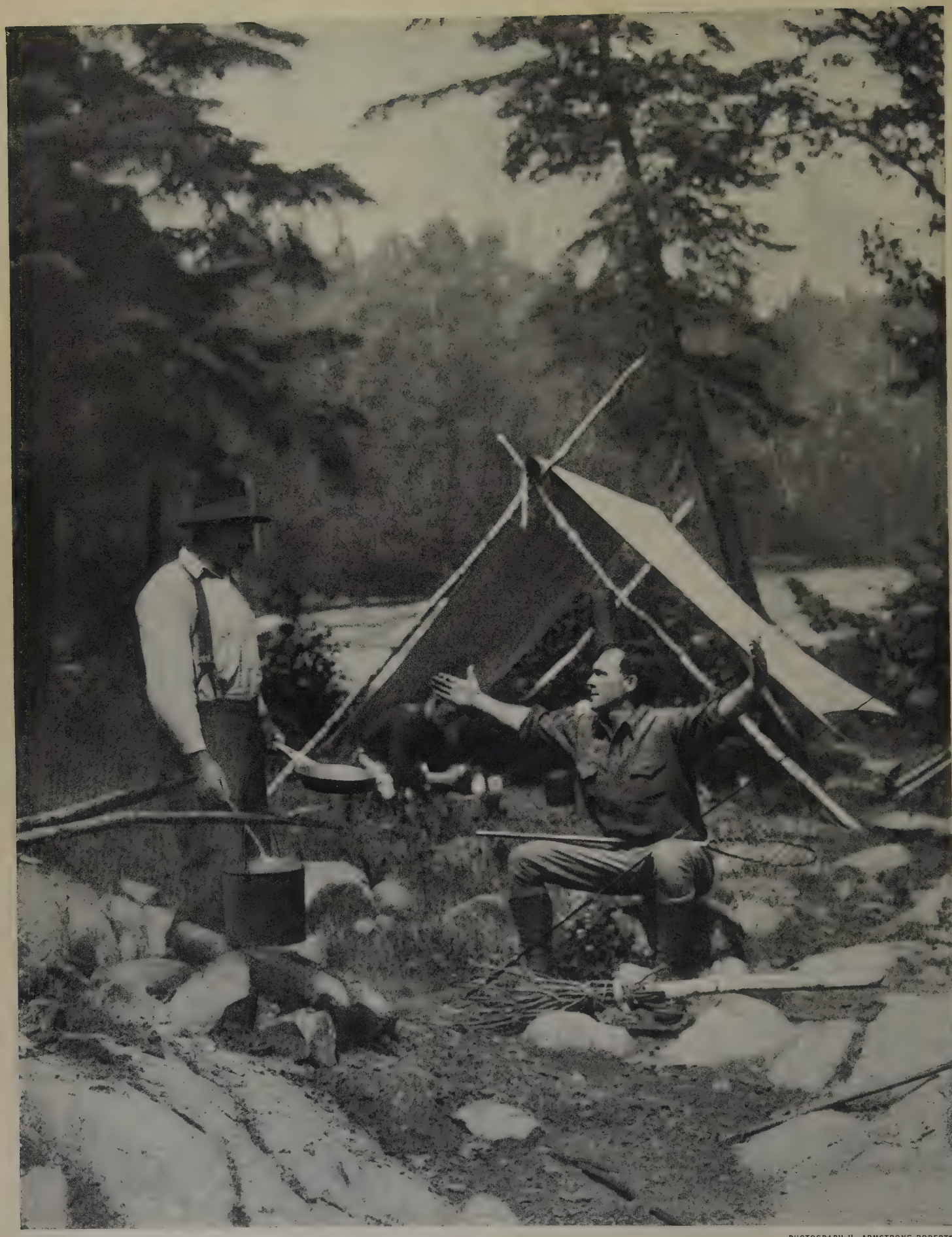
Nine months of captivity have passed and now the polyphemus moth escapes from its silken cocoon, climbs the nearest object and when thoroughly dried, sails off into the sunshine.

Until October, white and yellow butterflies are numerous everywhere, fluttering over the meadow flowers or gathering around puddles in the country road.

The mourning cloak now lays her eggs in regular, even masses encircling willow, elm or poplar twigs. In a few weeks caterpillars will crawl from holes in the tops of the eggs and will arrange themselves in equally regular rows on the leaves.

Two fine meteoric showers will take place in May. Both are swift and streak-leaving. The first occurs in the eastern sky about May 6; the second in the northeast about May 11.

Prepared for Nature Magazine by the Cleveland Museum of Natural History



PHOTOGRAPH H. ARMSTRONG ROBERTS

NEED A CAPTION BE WRITTEN FOR THIS?

The photographer labels it, "The Big One Got Away." Possibly, "Now You Tell One" would be an equally appropriate title.

PROVISO TOWNSHIP
HIGH SCHOOL
LIBRARY
MAYWOOD

NATURE MAGAZINE

Vol. VII MAY, 1926 No. 5

But Nature is not solitude;
She crowds us with her thronging wood;
Her many hands reach out to us,
Her many tongues are garrulous;

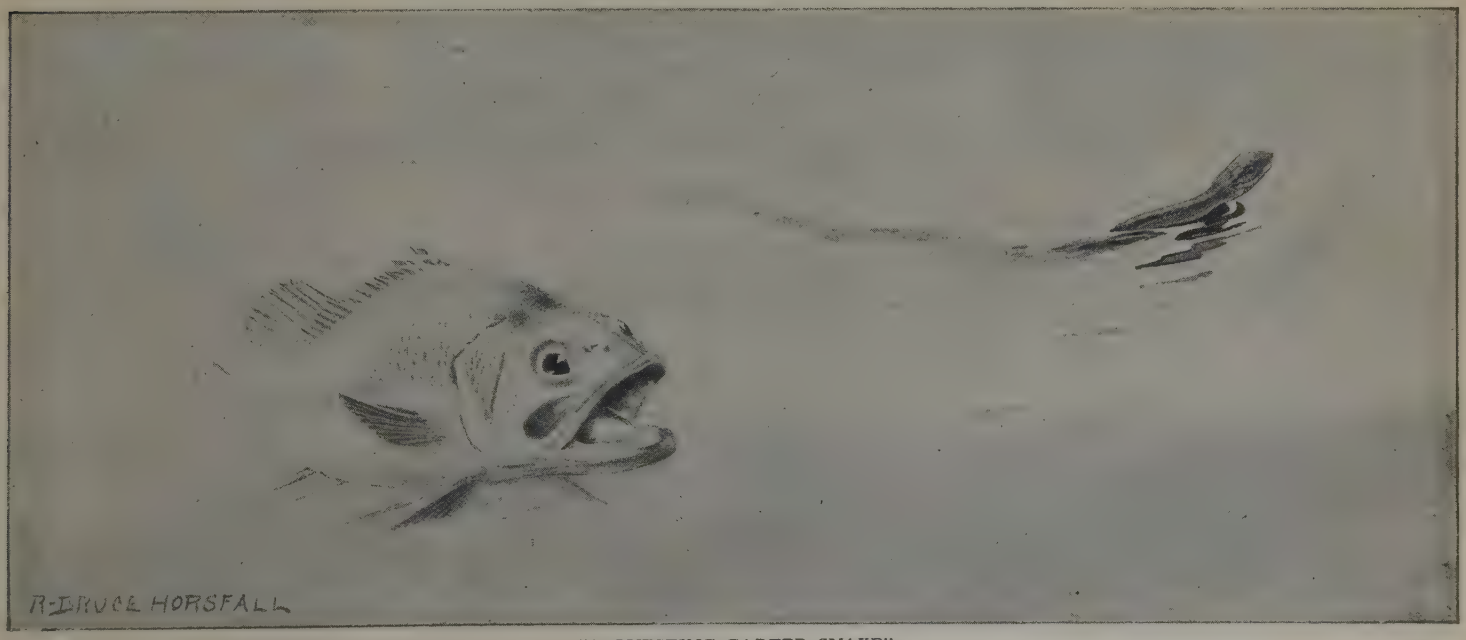
Perpetual riddles of surprise
She offers to our ears and eyes;
She will not leave our senses still,
But drags them captive at her will.
—WHITTIER.

THE BARON OF COWFOOT LAKE

By BEN HUR LAMPMAN

NOW THIS POND in the cottonwoods, you must know, was amber as very old honey, so that none might be sure of its depth except the fishes themselves, or the herons that came. For Cowfoot Lake, as it was called by courtesy, made a brew of the fallen foliage of autumn, throughout the misty winter, the welcome spring and midway of summer's self. And amber it must remain until the river rose to sweep it clean again. It was, in fine, one of those minor dependencies of the bottoms, which have the great stream for godmother and must wait her gift. The mink knew the pond, and now and again an otter hunted it from bank to bank, and swans had been seen there. It was loved of willows and wood-duck. More particularly it was the province and demesne of its overlord, and a testy baron he was, by all accounts.

And on this day of which one speaks—in late June, it was, and with morning no more than waking—the Baron was especially brief of temper, as he lay at his station in the tangled roots of the willows, the bold eyes of him striving to pierce that darkly golden water. He was motionless, as though in dream, this broad-flanked fellow, and the pugnacious dorsal fin was smoothly folded, the pectorals momently at rest. But the aggressive thrust of the lower jaw, that never belies the temper of the bass, seemed more than ever predatory. For though he was lord of Cowfoot, from willow to sedge, he had ruled it so harshly in the interests of appetite that its scant store of smaller fishes was all but gone,



"A QUESTING GARTER SNAKE"

"Wearing a lone stripe of dark orange down his rounded back, took to water and swam toward Hyla's home."

and his heavy paunch was lank beneath the dark indistinct lateral stripe. A large-mouthed bass of the bottoms, ten pounds in weight when Providence was kind, and by a whim of Providence the only fish of his species held in the cottonwood pond. Above him, from that curious silver that was the surface, vapor arose in drifting phantoms—and mellow and sad from the river a distant steamer called through the murk. Yet where he sulked all was soundless with an amber silence.

You are not to suppose his moodiness wholly a matter of hunger, since in this respect he was as staunch a philosopher as any savage. When choice fare dwindled he took what offered, and with a rush that would not often be denied. And beyond question he would have starved with stoic grace, if starvation had been decreed. No, to his mind, or to his instinct, there was something amiss with the season, and that which he lacked and longed for was the invasion of the bottoms by a swollen river —whence he might escape the pond to expand his gills in turbid snow-water, and be off to elsewhere, cruising, seeking, a shadow at the feet of the flooded cottonwoods, a sounding splash at sunset. And between this desire and that, the one for adventure and the other for food, he was as grumpy a bass as ever twirled a caudal fin. He was as gruff as an earl with the gout.

"RANA WAS BY NO MEANS AN OAF"

"Ordinarily he was uncommonly alert and prudent—yet June hath a way with a frog."

Do not be regretting that the water was of this singular hue, precisely that of spiced metheglin, since you may be assured that you could not have seen him, were it never so clear, when he slipped forth from the willow roots and went in search of breakfast. That is to say, if you had caught a glimpse of him under the most favorable of circumstances you would have seen no more than the wraith of a fish—visional, pallid, so like the green depths as to be of them, save for the dark band on his flank. Why, you might never have known that you had glimpsed him, but would have gone away thinking of those tricks that sun and shadow play in a pond. As for this Baron of ours, he was in scarcely better case, because in the bright dusk about him he could see no more than a fin's thrust in advance of his eager jaws. But he knew a thousand and one secrets that we shall never know, and these made ample amends. Indeed, this tinctured water was of some advantage to him, for if he could not see he could not then be seen. He drifted stealthily, and, as he drifted, with an eye to the pale surface, to the tips of the trailing willows, to the dim bulk of snag and sunken skiff, he was thinking ever so resolutely. And this was what he was thinking: "Frog." No more than that. "Frog." For frogs make commotion, and it is good to strike at them.

But Rana the bull-frog, who hunched in the spatterdock pads, was by no means an oaf, for all his lantern-jowls and his air of complacent stupidity. Ordinarily he was uncommonly alert and prudent—yet June hath a way with a frog. All splendidly splotched in green and gold, with fugitive colors mingling, the better to match the spatterdock and its shadows, he sat there and throated the lyric of his kind. A very lovely song it was, too, for any who had ear for it, and if you were bemused with the vicinage. It is betwixt and between the bellow of a melancholy bull, for which he is fittingly named, and the round blaring of a boat's whistle. Why, sirs, it is such a sound as may not, must not, proceed from a frog, and yet in spite of all doubting it does. And Rana, singing to his portly lady, and listening with heart a-flutter, and singing once again, quite forgot the dread overlord of the pond—forgot all else save June. Almost he leaned to listen . . . and listening seemed to hear her ponderous plashing in the drenched willows. Whereat the foolish heart of Rana leaped, and he with it, and together they woke the quiet water, and there he sprawled, listening. Yet a tiny thrill of terror nipped at his nerves, and he answered it with one strong stroke of the fat hams and webbed feet. The stroke sped him in from the depths and over the shallow, safely to the bank, and there he crouched in a heron track.

Behind him the surface dipped to a spinning eddy, lune-green at its heart, and there was a flash of the Baron's burnished scales as the bass missed his strike. Up sprang the huge fish, on that angry instant, high above the pond, with dorsal fin erect and threatening. When he took water again the cottonwoods echoed the splash. A faintest fragrance wafted shoreward, as of flowers and spices, for this is the fragrance of the bass. (If you choose to smile here, as you may, listen to Izaak Walton as he discourses of the English grayling: "And some think that he feeds on water-thyme and smells of it at his first taking out of the water; and they may think so with good reason as we do, that our smelts smell like violets at their being first caught; which I think is a truth.") Now here is something curious concerning Rana, and greatly to the credit of his prudence. No sooner had he gained the little flat of drab mud, whereon the heron had signed its foot, than he ceased to be green and golden and became burnt-umber and sad slate. The Baron, cruising onward, no longer thought "Frog."

As he cruised he came to the drove of carp, that know nothing of want so long as there is rich mud to be had. With dour eye he saw that they were amber as the pond itself, and fat as no fish save the bass have any right to be. He cleft the drove with his passage, and the carp swerved to either fin with stolid grace, fearing him not at all yet yielding him his due. They rose to the surface in his wake, twenty round mumbling mouths in a ring, to feed on some light drift scorned of bass. Yet somehow he was aware that the carp, too, were impatient in their slow, phlegmatic way for the summer flood . . . to browse on clover blossoms in the sunken pastures . . . how odd a preference. And he passed on, quite forgetting them, and before him the mottled sculpin burrowed deep into the silt, and behind him a brilliant sunfish, no larger than an elder leaf, crept shining forth from the rushes and rose to a floundering gnat. It drew near to mid-morning and the light in the pond was like nothing so much as suffused gold, with a hint of copper in it. Had it not been for hunger this pond, one believes, would have grown drowsy.

The Baron was conscious of a huge appetite, and a dull anger, as he rested just geyond the spit of sedge that thrust into the pond. The sedge was flooded at the roots, but in its mazes the water was far too scanty for his bulk. And there the sun had warmed a nursery for larvae of many sorts, and sundry swart sticklebacks lurked, and possibly a striped perch or two. Certainly there were tadpoles to be had if he but could come at them, the black tadpoles of the wood frog, which wakens from sleep and is about its mating long before Rana the bull-frog has stretched his heavy limbs and risen to blink and bellow. Yet if one mustered all his patience and lay quietly beside the sedge, it might be that some incautious morsel would venture over the depths—and so be lost to the nursery. Patience. This shadowy hunger waited.

It appeared that ink had been spilled in the sedge, until a broad blotch of it quite darkened the water. But it did not diffuse itself, this darkness, this odd ebony, and the border of it fluttered constantly. You would have been astonished to see it move swiftly, fluently, to the right, lengthening as it moved, then shaping itself anew into a rough circle. And twice you must have looked, and nearer, before you perceived that many tadpoles made it, and that each one of them was black as a fragment of night. They were very happy, these tadpoles, as they browsed with midget mouths on the brown algae of the sedge stems, or clustering merrily about a sodden insect, made a feast with many smackings, like elves at a banquet. They were so happy, in truth, that they put all danger from them, and romped in the shallows, while the Gray One drew near. And this Gray One, as the pond knows, is that terror of tadpoles, the water-boatman, or oar-bug, who swims on his back as briskly as any kanaka, and who holds fast that which he seizes. Perhaps the black tadpoles were fatalists, in some formless thought of theirs, for he slew one of them each day, and yet they were merry. The Gray One came jerkily toward the herd, plying his oars . . . nearer and nearer. They paid him no least attention, for all their tails were outward as they fed. With flashing speed he cast himself among them, and his beak was fleshed.

"THE GRAY ONE CLINGING TO HIS PAUNCH"

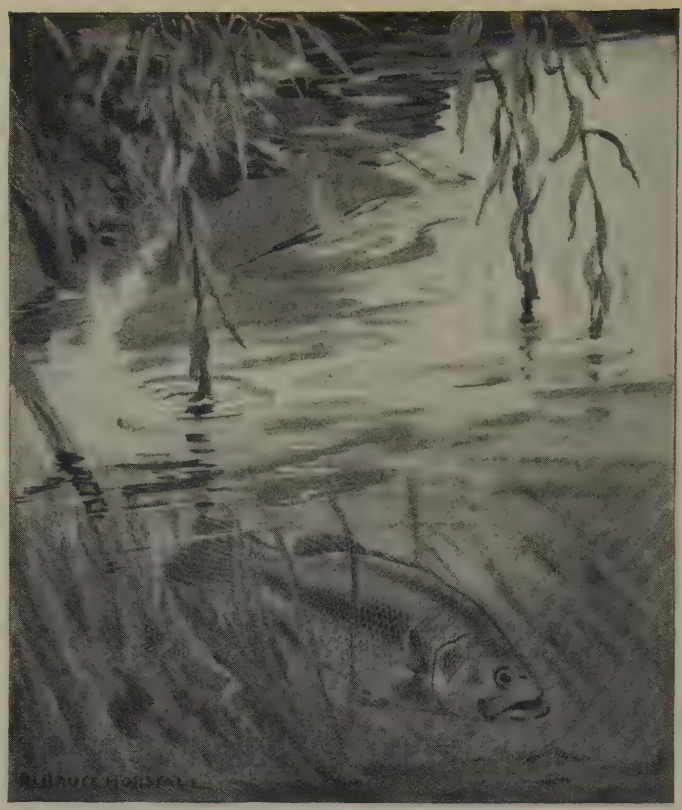
"This tadpole was huge, yet the fierce boatman wore him down as a wolf worries a buffalo."

You may well believe that all was confusion there in the pleasant sedge. The herd scattered and fled, headlong, and sundry tadpoles dove far into the lower tangle to hide away from death. And over and over above them tumbled and tossed in torment the captured brother, with the Gray One clinging to his paunch. This tadpole was huge beside the Gray One, yet the fierce boatman wore him down as a wolf worries a buffalo, and laid bare the victim's vitals the while that savage hold was never relinquished. But the striving of these two carried them hither and yon through the nursery, and even as life quitted the tadpole they rolled from the warm brink into the colder water and went wavering downward. The patient Baron struck. He struck almost lazily, despite his hunger, since there was small need for haste. The maw that would have taken Rana himself at a gulp, or a carp in its first year, engulfed the Gray One and his kill effortlessly, as a small matter. Yet he was cheered.

And, idling reflectively onward, with an eye to this and to that, he came at length to the mud pastures of the carp, where tails wave gravely from the surface, and contented gruntings may be heard by the belted kingfisher on his snag. There was a bare chance that some fat chub might linger there, feeling a greater security in that minor depth, or that thin cousin of his, the crappie . . . or something. And again he took his station where the clay slipped down to deeper water, and watched the weaving dimness of the carp, and considered his hunger, and felt a thirst for the flood, and was in all as moody a fellow as might be found in any pond. It occurred to him that he might dash in and drive the carp away as they deserved. It occurred to him that there was naught in this. He waited . . . possibly a chub.

A shadow floated through the amber stillness, describing a smooth arc. It was gone and then it came again, drifting

across the pond, and, as it passed, the coolness of it brushed his snout. At the third crossing of the shadow he drew away into yet deeper water, backing slowly, until a comforting depth was over him—for shadows such as this were ominous, he knew not why. And in that moment there was a sounding splash where the carp were. The water was shot with splintered silver and ascending globes of pearl. A dark bulk was yonder. Beneath it writhed and struggled a golden fish in golden murk. Had you been there, where the sweet-brier flowers and the wild blackberries ripen, you would have seen the ruffled head of the osprey weaving from the pond, and marked the buffeting of those stout wings, whence spray was cast, as the bird rose heavily with a sleek carp in its talons. For the moment, and that only, the Baron remembered why it was that he feared the arch of a moving shadow. He was gone.



"GRUFF AS AN EARL WITH THE GOUT"
Between desire for food and for adventure "he was as grumpy a bass as ever twirled a caudal fin."

He went, when his nerves were his own again, to the place where the crawfish lives. She was at home, this wariest of amazons, who alone had escaped him, and in the grotesquerie of her countenance bliss must have been, for an infinite eye to see—since clinging to the under-plates of her tail, and burrowing among the spider-legs of her, were numerous infants of her own, fragile, translucent, pitiful and dear. In a manner of speaking she clasped them to her breast, this ugly, competent mother, until such time as they might find refuge in the sedge, and themselves grow rough and terrible. She was at home, and very near to her cave in the clay . . . and he regarded her, and she him. With such a creature as this to comfort him, the Baron felt that he might drowse. He cared not a whit for the brandished claw, that will nip a fingerling in two as though it were trash. Such claws, digestively considered, were excellent. And then, as they had played the game so often, he rushed upon her with gaping, cavernous jaws—while with a single inward stroke of her armored tail the mother crawfish flipped through the portal of her cave. Sediment arose cloudily, and sodden leaves were whirled, and in the blackness of his temper the Baron leaped high into the sunshine, his dorsal fin rigid with rage. As the pond closed over him fortune relented and was kind. For he glimpsed a bright V cleaving the pond at its surface, and knew the pliant thrust of the lean swimmer that made it. If a fish may crouch, he crouched, ere with a stroke and a swerve he launched himself.

On the northern shore of the pond called Cowfoot was but poor hunting, as any ophidian could have told you, whereas the southern bank was at this season the home of Hyla the tree frog, green as a new leaf, who had come down from the forest to be a fellow of family. You might hear him shrilling at any hour, and very sweet and clear it was, this music he made. For this reason, which seemed to him the best of all possible reasons, a questing garter snake, wearing a lone stripe of dark orange down his rounded back, took to water and swam toward Hyla's home. He dove once at whim or shadow, near the marge, then held his course for the blue clay palisades beyond.

He thought of Hyla as he swam, for his stomach had that day been comforted by but a single earthworm; and half way over he thought of Hyla again. And if you care to be precise about it, this thought, as the water parted at his slender throat, and washed the orange stripe to brightness, was almost literally his last. All else was terror. For bronze flashed under him, and a heavy swirl marked where he had been, and he was seen no more. Midway of the pond the Baron waved meditative fins, and seemed to think long, grave, studious thoughts, which was far from the case. For this is what he was thinking: "Well!" And again, somewhat grumpily, but quite pleased with himself, "Well!"

Meantime the river, whispering, widening, with its tribute from the white, far ranges, pressed outward from its banks and through the cottonwoods—until at length it ventured a finger of chill, saffron flood into Cowfoot Lake. The trickle grew to a chuckle, and the chuckle to a frothy laughter—and as the Baron turned to his willows the taste of that invading current slipped into his astonished gills.

For an instant only he mulled it, and then—beyond question—he leaped as he had never leaped before. He saw the broken water where carp were wallowing, crowding . . . and was himself among them—striking to right and left at the largess of the freshet. This was his June returned to him.

Round and magnificent of paunch he made his way at twilight to the river, great with flood—up the log-strewn ravine, past the pale groping suckers, the prowling silver, greedy, chubs. And the river found a new lake for him, and a brave mate, after the custom of rivers, and the amber depths of the prison lake became but a dim memory.

Readers of NATURE MAGAZINE will be pleased to learn that beginning with the July issue the color illustrations will be bound into the magazine, insuring them against loss and damage. There will be twelve subjects every other month, giving our readers during the year much more than ever before of the delightful works of R. Bruce Horsfall. Although there will be no color in the June issue, this lack will be more than made up the following month

HOW A FEATHERED ARCHITECT WORKS

By L. W. Brownell

(PHOTOGRAPHS BY THE AUTHOR)

TO THOSE who regard the birds merely from the viewpoint of a passer-by, with no deeper thought as to their activities, their lives must seem to be filled with nothing more serious than a continuous round of singing and joyous flitting through the soft airs of spring and summer. To him who studies their habits more closely, however, it is soon apparent that theirs is not an entirely care-free existence and that their days are ofttimes filled by fairly strenuous labors.

More particularly is this true during the spring and summer when they are bringing their offspring into the world. Then they are busy every day from early morn until almost dark in the labor of satisfying hungry baby birds. And these youngsters are most exacting taskmasters with appetites that demand attention.

Nor is it only at this time of the year that a bird's life is filled with hard work. They are busy constantly waging war for mankind against the tremendous army of insects that, were it not for them, would soon completely overwhelm the earth.

The number of young brought forth each year by the birds is enormous and yet it is scarcely enough to offset the loss in the feathered ranks by death. In fact, it is undoubtedly all too true that the number of birds in the world is slowly but steadily diminishing instead of increasing.

Aside from man, who should be their best friend (unfortunately he not always is), the birds have a number of natural enemies, not the least of them the elements. At the seasons of migrations large numbers of them are the toll of storms. Some few years ago a particularly large flock of migrating birds was overtaken in the middle west by a belated blizzard and it was conservatively estimated that not less than a million birds were frozen to death in one night. A bird's life is never free from danger. Cares and troubles they have almost as numerous as has mankind. We might well take a lesson from them in how to meet these cares and tribulations and still maintain a joyous spirit.

Soon after the birds arrive at their nesting grounds in the spring from their winter's sojourn in the south they mate and almost immediately commence their search for a suitable site in which to build their nest. The choice of a homesite is most important and not so easy or quickly accomplished as it might seem to be. The principal food supply must be handy. It must be placed so that it is fairly well hidden from the prying eyes of their enemies and also protected, as well as possible, from the elements. It must not be far distant from the source of the materials used in its construction and last, but not least, the site itself must be absolutely adapted to the particular form of structure peculiar to the species.

"Personally I consider that there is no better pastime as well as means of studying Nature than the use of the camera," writes Mr. Brownell. Few people have ever hunted as assiduously and successfully with the camera as the author of the article. Here he gives us an intimate glimpse of the work of the Red-eyed Vireo in the construction of its home and cradle for its babies. It will soon be nesting time again.

RED-EYED VIREO FEEDING HER YOUNG

The youngsters have healthy appetites and are constantly demanding an increasing amount of food.

No sooner have they made their final decision than the really considerable task of building the nest and fitting it for the occupancy of the young is commenced. I call it a considerable task advisedly, for anyone who has ever closely examined a birds's nest and has fully realized that it was made by two little creatures with no other tools than their feet and bills must admit it is to be no insignificant job.

Not long ago it was my privilege to watch a pair of Red-eyed Vireos, one of our fairly common small-sized birds, during the entire time that they were occupied in the building of their nest and to make several photographs of it at different stages of its construction. The photographs are those which illustrate this article and I intend to tell you, as well as I can, of the building of the nest.

The nest of this species is a rather small, cup-shaped affair hanging pendant from some small, horizontal crotch, usually at or near the extreme end of a branch. It is a real marvel of symmetry and neatness. About two and one-half

THE FOUNDATION

The first pieces of building material are allowed to hang loosely.

inches across and the same, or nearly so, in depth, it is compactly and strongly built and will withstand the storms of winter so well that it is often in almost as good condition the following spring as when it was first built. However, it is never used a second time by the birds, although, occasionally, a pair of white-footed mice will cover over and occupy one of these during the winter.

It is constructed of coarse grasses, strippings from dead weed stems, the inner bark of cedar, strips of grape-vine bark and similar pliable material. The birds frequently exercise their artistic sense by adorning the outside with small scraps of paper, small cocoons, bits of spider's web and egg sacs and other like articles.

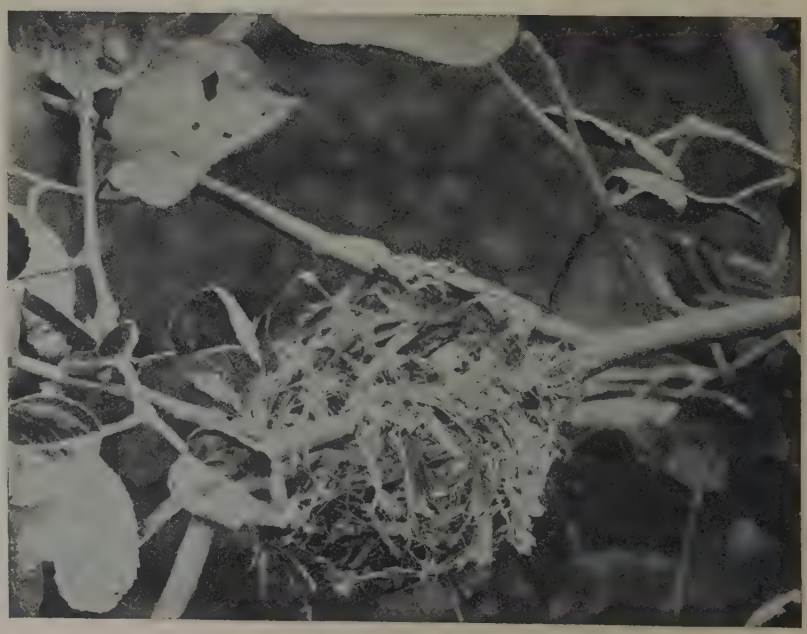
I first saw my nest when it was only just started and not more than a dozen pieces of material had been placed in position. The situation was at the end of a low hanging branch of an apple tree and not more than five feet above ground. I was fortunate in having found a pair of birds that did not seem to fear me in the least but continued undisturbed with their building operations while I stood, with my camera, only about three feet away. In fact during the entire time they appeared to take absolutely no notice of me and several times they even alighted upon my camera in going to and from the nest.

The beginnings of the nest, the foundation so to speak, were made from long, coarse, dead grasses. These were laid loosely over the forks of the crotch, occasionally with a turn or two around the twig to hold them in position, and allowed to hang down in loops and streamers. After the first three or four hours' work the nest still had little or no form and looked more like the storm-beaten wreck of a nest than the beginning of one.

Gradually, however, as the birds continued to bring material the loose ends of these streamers were caught up and woven in with the new pieces. Gradually the foundation began to take shape and looked as though the result might be worth while and not merely a tangle of dead grass caught on the branch. At first it seemed as though the birds were working at random, simply placing the material they brought with little thought as to what the final outcome would be. But, as they progressed, it could be seen that they were working with a definite method and each new piece of material brought had its allotted position as surely as do the boards, beams and rafters in a human abode. Nor were the pieces chosen at random but selected with some care as to their fitness, and I noticed upon several occasions that if a piece was brought that, after several trials, did not exactly fit the requirements, it was discarded and another piece sought to take its place. By the time that I left, in the late afternoon, the nest still had a very ragged appearance, but I could see that the birds were gradually bringing order out of the chaos.

THE SECOND DAY

The home begins gradually to take on a definite form. (Above.)



THREE DAYS' WORK

Shell of the nest is now completed but not yet lined. (Below.)

On the second day of labor the nest began to take a definite shape, although still quite ragged and unkempt looking. All the work so far had been done by the birds while clinging to the branches and bending far over to push and pull each piece into position with their bills, cleverly interweaving it with those already there. Often they would literally stand upon their heads. This process was continued during the greater part of this day, but by the middle of the afternoon the shell had sufficient strength to bear the weight of the builder's body. Thereafter each bird upon arriving with a new piece of material would, after first attaching and partly weaving it into the body of the structure, settle down into the nest, shaping it with their bodies and at the same time twitching and pulling the piece into position. Often one of the birds, usually the female, would remain in the nest while her mate brought her material. She would turn round and round, pulling at this piece, giving a tug at that, tucking in some loose end here and another there, until all were settled to her entire satisfaction. Then, if her mate had not in the meantime brought some more material, off she would go to find some for herself. Frequently I saw her pull out some piece that had already been woven in, evidently unsatisfactorily, and adjust it over again or discard it entirely. Thus the work was continued for the rest of the afternoon and into the evening.

Throughout the third day a much smaller amount of material was added. The birds spent much of their time in shaping and adjusting the nest. Occasionally, when they seemed to find a spot that needed strengthening they would leave and be gone for some time, probably having difficulty in finding just the piece needed. During this day also they brought pieces of material that seemed to be merely for adornment. These they attached to the outside of the nest and one could not but admit that they added to the beauty of the structure and possibly helped to blend the home with the surroundings. By six o'clock that evening, when I left, the outer shell of the nest seemed to be practically completed and the builders had left for the day. All that remained was to fit the lining to it.

A FAMILY STARTED

The nest now has its complement of four eggs of future vireos.

WHAT THE NEST YIELDED

Mother vireo and her baby, whose mouth is always open for food. (Above.)

FOUR DAYS AND DONE

The lining has been fitted in and the home is finished. (Below.)

This lining, in the case of the nest of the vireo, is almost always composed of fine strippings of bark from the grape-vine, and is usually not attached to the body of the nest but is woven together and fitted snugly inside. The lining may usually be lifted out intact without injury to it or the rest of the nest.

When I arrived upon the fourth morning work upon this lining had already commenced, but it took the birds nearly all day before they were satisfied with the job. They seemed to exercise great care in the selection of the material and to use the greatest pains in its adjustment. They would spend long periods sitting in the nest, turning their bodies round

and round and pressing each piece down firmly and smoothly after it had been woven in with the others. No piece was allowed to remain on edge, but all must lie flat and evenly plaited as basket work. This was to be their babies' cradle and they wished to make sure that there would be no sharp edges to press into their tender bodies.

It was late in the afternoon before they seemed to be completely satisfied with their work and both left, possibly to search for and devour a leisurely supper. At all events it was nearly an hour before I saw either of them again, and in the meantime I was at liberty to examine the finished article closely. And it was a finished article in every sense of the word—firmly and compactly built to withstand all attempts of the elements to destroy it; securely fastened to its supports so that it would take considerable strength to loosen it, and with the lining as smooth and symmetrical as though it had been pressed in by machinery. In a word, it was a work of art designed for use, and although I had watched practically every step of its construction I could not but wonder how they had accomplished it. Not the least wonderful feature of the performance is that they can do it with no previous training, for the first nest built by a pair of birds is almost, if not quite, as perfectly constructed as one built by an older and more experienced pair and the design is always the same.

Three days later the first egg was laid and each day following found one more added until the full complement of four had been laid. Occasionally the vireo lays three eggs, rarely five, but four is the usual number.

Now came the tedious period of incubation for the mother who must never leave the eggs for more than a few minutes lest they cool too much. With some species the male occasionally relieves the female at this duty, but the greater part of it devolves upon the mother.

As soon as the young are hatched the real labors of their parents begin, for they must be kept supplied with a never-ceasing but constantly increasing supply of food. However, this burden is assumed right cheerfully, and, with many species of birds, as soon as the first brood is raised to an age when they are able to forage for themselves, the old birds commence preparations for a second brood, and all the work is to be done over again, usually even to the building of the nest.

I kept watch over my little family of birds for two reasons: I wished to see them safely launched upon the world and I wanted the nest as soon as they were finished with it to discover, if possible, just how many pieces of material had gone into its construction.

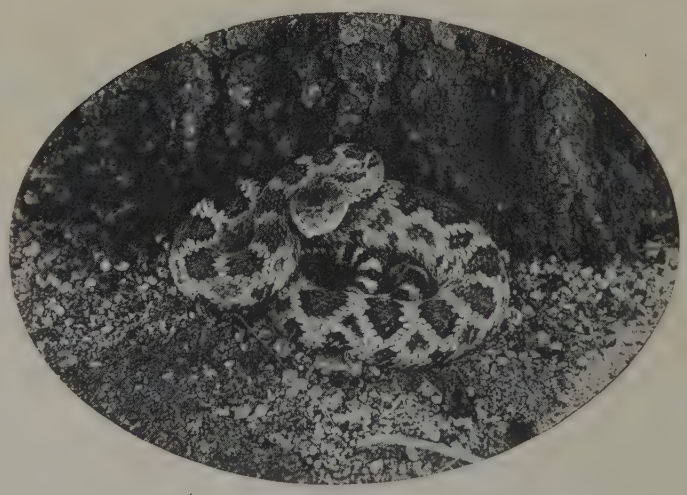
So, as soon as the young had left, I took it home with me and proceeded to dissect it. This was not an easy job. It was necessary to use the greatest care in order to take each piece out whole. Once more I paid tribute to the marvellous art of weaving possessed by these birds, and I realized that I, nor any other human being, with all my ten fingers and every tool I might bring to my aid could ever hope to duplicate it.

Finally, after some hours of steady work, I had it reduced to its component parts. How many pieces were there? A total of one thousand, one hundred and eighty-six pieces! Quite a number for one pair of little birds to carry one by one and weave into the structure of a nest in less than four days of actual labor. Think it over and see if you agree.

When and How Far Can a Rattlesnake Strike?

By Joseph Dixon

A PACIFIC Rattlesnake (*Crotalus oreganus*) was found on the floor of Kings River Canyon by the writer on September 12, 1916. When first discovered, the reptile was crawling leisurely along a barren, open, sandy flat during the warmest part of a bright, sunny forenoon. Upon being disturbed, the snake altered its course and made directly for some patches of broken shadows under a black oak. Here the snake coiled up close to the base of the tree and sought to escape notice by remaining perfectly still. Although coiled and prepared for battle, the snake was seemingly so confident of escaping detection that it permitted me to take its photograph at the close distance of twenty-four inches from snake to lense without once offering to strike.



CLOSE ENOUGH FOR MOST OF US

This picture was taken within twenty-four inches of this rattlesnake, but it did not strike.

Upon being routed out from his place of seclusion the snake tried to escape into the open, but was headed off. A moment later when the snake was not coiled, but crawling along at a lively gait, my shadow happened to fall on the ground directly in front of the now thoroughly angry reptile. Without a moment's hesitation and without stopping to coil, the snake doubled quickly back and struck so violently at my shadow that he reached out for nearly his entire length of slightly less than thirty inches. From where I was standing, I could see, as did several other bystanders, that not more than four inches of the snake's body remained on the ground when it struck at my shadow.

From experiments with "side-winders" in Death Valley and with other species of rattlesnakes elsewhere, I have not, except for this experience, found a rattlesnake that could strike more than half his length unless coiled and ready to strike. Now, as for me, the "danger zone" about a rattlesnake on a warm day in the open extends in all directions for a distance equal to the length of the snake.

The Seventh Sleeper

By Samuel Scoville, Jr.

THERE are seven animals who sleep through our winters safe from hunger and cold and danger. I once rhymed their names for four children of my acquaintance in the bit of free verse in the box. (I call it free because I don't get anything extra for it.) All of these Sleepers are interesting, most of them friendly, but the most useful of them all is "Sekak," as those Wood-Indians, the Crees, have named our American skunk.

The Bat and the Bear, they never care
What winter winds may blow:
The Jumping-Mouse in his cozy house
Is safe from ice and snow.

The Chipmunk and the Woodchuck,
The Skunk, who's slow but sure,
The ringed Raccoon, who hates the moon,
Have found for cold the cure.

He is the last one of the Sleepers to go to bed in winter and the first to come out in the spring. Long after the black bear has holed up in some jug-shaped hollow dug in a sloping bank lined with leaves and masked with brush; after the bat has hung himself upside-down to sleep until spring; when the raccoon is fast asleep in his tree-top and the woodchuck and the chipmunk in their warm burrows underground; even after the jumping-mouse has curled up in a ball wrapped around with his long silky tail well below frost-line, the tracks of the Seventh Sleeper can still be seen in the early snow. They are zigzag and near-apart with the furrow of his dragging feet between each print, for Sekak never hastens. His motto is—"Don't hurry, others will." Sometimes to be sure he gallops but very lumberingly. Then his tracks show four abreast in a diagonal line. He believes that late to bed and early to rise makes a skunk healthy, wealthy and wise. During the coldest part of the winter he goes underground to sleep fitfully, ready to come out any warm day. When he does go to bed he digs a shallow burrow with two entrances and lines it with grass or else calmly appropriates a woodchuck's burrow.

Like the bear the skunk walks flat-footed. His naked flat soles are wrinkled crossways and the hind-feet show no claw-marks in the snow but the fore-paws have claws which make him one of the best diggers among all the wild-folk, surpassed only by the badger and the woodchuck.

PHOTOGRAPH H. T. MIDDLETON

A BEAUTIFUL STUDY IN BLACK AND WHITE

He has outlived all the other members of his family by developing a little specialty of his own.

Sekak is a beautiful study in black and white with a black head and back, a white stripe running from between his eyes to his nose, stripes of white along his sides and a big white ruff. About the size of a house-cat and weighing between eight and ten pounds, he is over one-third tail, this adornment accounting for fully ten of his twenty-eight inches of length. This tail is nearly as wide as it is long, with a white tip, and is only surpassed in its splendor by the magnificent tail of the giant ant-eater of South America. Wise folk seeing that white tuft remove themselves elsewhere with exceeding rapidity. As for the unwise—they wish they had.

The skunk is a living example of the axiom that it pays to specialize. He cannot swim like the otter, nor climb like the marten, nor run like the fisher. He has neither the strength of the wolverine nor the fierceness of the weasel. Yet he has outlived all these members of his family by developing a little specialty of his own which bids fair to save him from the attacks of civilization for many years to come. He discovered the gas-attack long before warring man. His weapon is a movable duct through which he can throw a stream of liquid musk with deadly accuracy from five to ten feet. It is phosphorescent by night and not only has a devastating odor which nauseates humans but produces a heavy gas which like mustard or ammonia gas will choke and strangle any animal breathing its full force.

The liquid musk is a clear, golden-yellow fluid full of little bubbles of the devastating gas, and curiously enough is almost identical in appearance with the venom of the rattlesnake. As to its odor, it has been described feelingly as a mixture of perfume-musk, essence of garlic, burning sulphur, and sewer gas, raised to the thousandth power. Its effect is very much like that produced by the fumes of ammonia, another animal product, or the mustard-gas of modern warfare. It may cause blindness, convulsions, and such constriction and congestion of the breathing passages as even to bring about death. Some individuals and animals, however, seem to be more or less immune to the effects of this secretion. I remember once attending by invitation a possum hunt conducted by a number of noted possumists of color. We were accompanied by a bevy of miscellaneous dogs. The possums were generally found wandering here and there among the thickets, or located in low persimmon trees. Every now and then one of the dogs would bring to bay a strolling skunk. As the skins had a considerable market value, these skunks were regarded as the special prize of the chase. The hunters dispatched them by a quick blow across the back which broke the spine. Such a blow paralyzed the muscles and effectually prevented any further artillery practice on the part of the skunk which received it. Before it could be delivered, both the hunter and the dog were usually exposed to an unerring barrage, which, however, seemed to cause them no especial inconvenience. Before long every hunter, except myself, had one or more skunks tucked away in his pockets.

It was a long, strong night. Before it was over I was in some doubt as to whether I had been attending a possum hunt or had taken part in a skunk chase. My family had no doubt whatever on the subject when I reached home the next morning. I was earnestly invited to tarry in the wilderness until such time as I could obtain a complete change of raiment. Thereafter I tried to give my hunting clothes away to the worthy poor. The poor, however, would have none of them, and they repose in a lone grave in a Philadelphia backyard even unto this day.

PHOTOGRAPH H. T. MIDDLETON

THE SKUNK WALKS FLAT FOOTED

The forepaws have claws which make him one of the best diggers among all wild folk, yielding only to the badger and woodchuck.

Although never too proud to fight, Sekak is always a sportsman and gives an opponent three warnings. If he meets you in the woods or fields he will not turn out, but will stamp on the ground with his forepaws like a little horse. That is danger-signal number one. If you keep on coming he will shake his head sadly as if saying to himself, "There's going to be trouble but it's not my fault," and will thereupon hoist aloft his resplendent tail. That is signal number two. If rushing on your doom you still advance, the drooping white tip of said tail will be slowly erected. That is the third and last warning. If then you stand still or slowly draw back all will yet be well. One step forward will cost one suit of clothes.

Sekak is a monogamist and mates in February or March. He believes in large families. A friend of mine once told me that the most impressive sight he had ever seen in nature was a mother-skunk one summer evening coming down a hillside followed in single file by a family of ten, each one waving aloft a resplendent black and white banner. He said that he could not have shown them greater respect if they had been a herd of elephants.

Young skunks are about the size of mice when they enter this world and do not open their eyes for about three weeks, and are not full-grown for six months. Even when first

YOUNG SEKAK ARRIVES FOR BREAKFAST

PHOTOGRAPH LORENE SQUIRE

Skunks are about the size of mice when they enter the world and are not full grown for six months.

born they show their black and white coloring and when frightened will go through all the motions of the skunk system of defense but do not secrete any musk until they are at least a month old.

Skunks are easily tamed and make good household pets, being superior to cats as mousers, and when once tamed never attempt to use their devastating defense.

Of the skunks there are nearly fifty species and subspecies, the smallest of which is the pigmy skunk of Mexico which, tail and all, is only about nine inches long. The flesh of all varieties of skunks is good to eat, being white and tasting like chicken.

The skunk has few enemies, for only the desperadoes among the wild folk dare to face his deadly barrage. Once I saw in the snow the story of a fox who had attacked a skunk who was digging grubs out of a stump. It was a sad story. The fox had stood for a long time watching the skunk, for his tracks were melted deep into the snow. Then I saw where he had sprung and landed beside the skunk evidently planning to snap its spine with one of those deadly slashes of which the fox like the wolf has the secret. Unfortunately for him the skunk snapped first. The atmosphere was still reminiscent of that bloodless battle. Around the stump the snow was covered with a tangle of tracks where the fox had dashed around and around in a circle blinded, choking for breath, and rolling over and over in the snow. On the far side of the maze of fox tracks a single series of tremendous bounds showed where a wiser and a smellier fox had departed toward the horizon with an incredible initial velocity. On the near side of the trodden circle neat mincing tracks showed where the skunk had moved away sedate and unhurried as ever.

PHOTOGRAPH LORENE SQUIRE

SEKAK IS EASILY TAMED

He makes a better mouser than a cat and once tamed never attempts to use his devastating weapon of defense.

Sometimes that fierce death-in-the-dark, the great horned owl, will occasionally pounce on a strolling skunk. Usually, however, he finds that the latter's antiaircraft armament is too strong for him and retires without honor to bear about with him the aftermath of his raid until his next moulting. Occasionally wildcats, as we have named the red-gray bay lynxes, those strange secretive haunters of the deep woods, will pounce on skunks from above and escape unsullied if they are able instantly to break the skunk's back and so paralyze the muscles on which it depends for defense. Always, however, the killing of a skunk is a desperate adventure for any of the wild folk.

Under the Skunk Geneva Convention the use of a gas-attack is strictly forbidden in any battle in which only skunks are engaged. In such a fight the combatants depend entirely on tooth and claw and break their usual silence by a low chirring note which expresses just as much rage and excitement as the shrieks and growls of more emotional fighters. Owing to the thickness of their fur, duels between skunks are for the most part bloodless battles. A nature-writer tells of watching two skunks clinched and whirling over and over a dead grouse. While thus preoccupied in rolling and biting and chirring, a red fox slipped in and secured the prize. As they came to the surface of the snow after an unusually energetic roll, they both caught sight at the same time of their prize disappearing in the jaws of the fox. Immediately they disengaged and stood for a moment side by side watching the vanishing fox. Then they turned somberly away and trotted off in opposite directions.

Sekak faces death whether by violence or disease with the same defense which experience has taught him is so effectual against all earthly enemies. Ernest Thompson Seton tells us of a tame skunk which he once owned who was killed by a meal of strong cheese, a rare tribute to the strength of that particular brand. Mr. Seton goes on to say that his final death-struggle culminated in a grand parting salute to earth and friends and the cheese.

The menu card of the skunk is as long as that of the bear. If unmolested he will eat his weight several times a week in grasshoppers, crickets, June-bugs, grubs, field-mice and potato-bugs. Besides these he feeds on snakes, chickens, lizards, salamanders, ground-squirrels, earthworms, crawfish, eggs of birds, turtles and snakes, grass, wasps, hornets and bumble-bees. Like the bear he is leather-lined and delights to scratch at low-set beehives and to gobble up the bees as fast as they come and will eat a whole swarm in two sittings.

In this second of his series of original and entertaining Nature stories, Mr. Shepheard-Walwyn discusses the place and effect of sound in the Harmonies of Nature. In a volume to be published in this country and abroad later this year, the author expands on these thoughts in a way fully as entertaining as these attractive shorter versions

THE HARMONIES OF NATURE—SOUND

By H. W. Shepheard-Walwyn

"THE NIGHTINGALE CAN AT TIMES BECOME A POSITIVE NUISANCE"

THE KINGDOM of Nature is ruled by three great forces—love, fear and food. These are the motive powers that might be said to inspire every action of importance throughout the entire area of the lower animal creation. These form the pivot around which revolve the functions of all the senses to which natural life is heir. Hearing, seeing, tasting, feeling, smelling—and if the report be really true that there exist other senses also, beyond the range of our human comprehension, then these, too, will inevitably fall into line with the rest. It does seem such a strange thing that the spirit of altruism should be practically an unknown quantity in this wonderful kingdom of Nature; that "Number One First" should be the prevailing motto in every department; that self should be the presiding deity in the life of every wild creature, great or small. Such an astounding paradox, that. In this beautiful realm—the one place, surely, where we would expect to see the doctrine of bearing one another's burdens carried into effect—we might yet travel from end to end without meeting one solitary instance of any desire to help a lame dog over the stile!

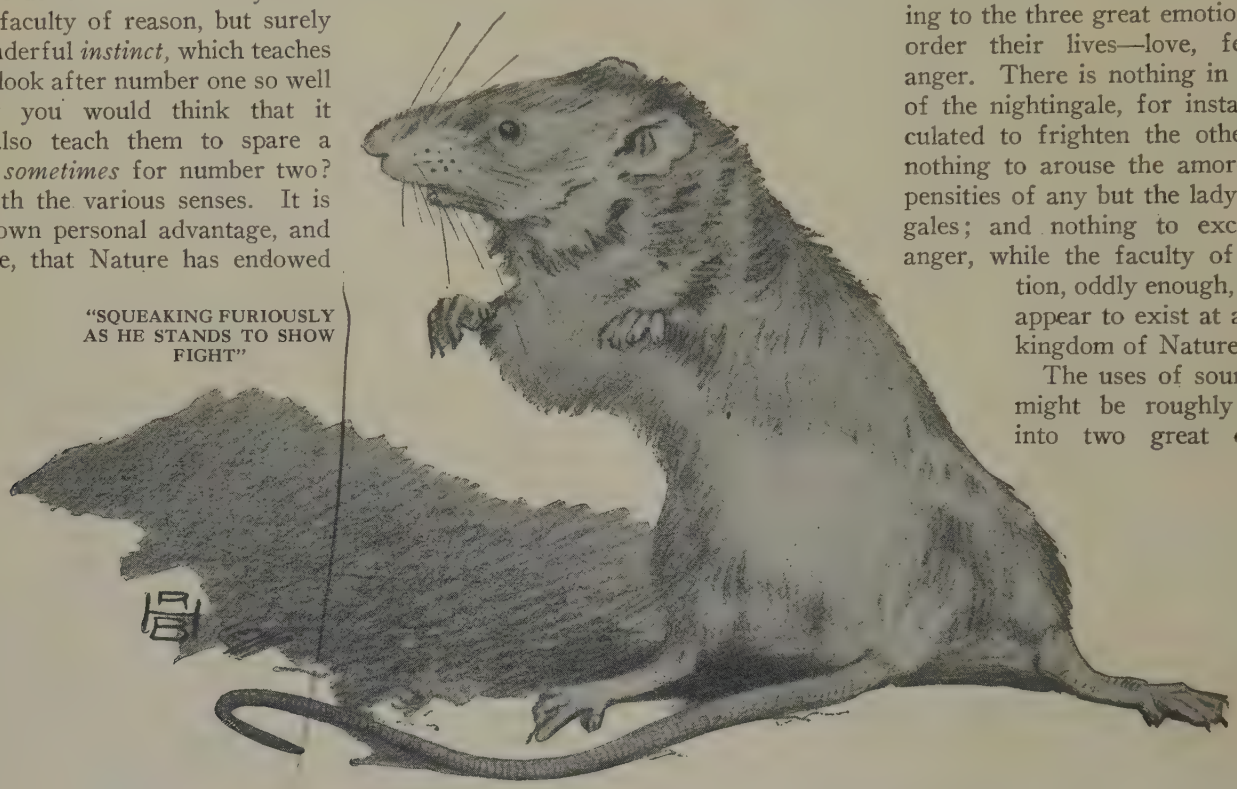
True, there is a case on record of a mole that risked his own life in a valiant attempt to save his wife and family from drowning when a sudden deluge had flooded their burrow, but this can only be regarded as an instance of the ordinary parental instinct run amuck, so to speak. It was part of that mole's personal scheme of life to beget and rear a family, and nothing else on earth or under the earth—chiefly *under* the earth in his case—would have kept him working for days to prepare a nursery for them when he might have been gadding about and enjoying himself. Do you suppose that this so-called heroic mole would have raised so much as a single claw to save anyone else's wife and family from drowning?

"HOWEVER BLACK THE GLOOM YOU WILL ALWAYS FIND A ROBIN"

Generally speaking, there is no room for pity, no place for patriotism, in the kingdom of Nature. Such shibboleths as "the greatest good to the greatest number" have no meaning in her vernacular. When a certain wily old fox managed to break into the enclosures of a Kentish pheasant-breeder last

spring, and in a few hours wantonly slaughtered two hundred and seventy-three birds valued at thirty shillings a head, was there any other thought in the mind of that bloodthirsty old rascal beyond what a royal time he was having? It was not even as though anyone could have told him that those pheasants happened to be heavily insured! Again—does the keen-eyed hawk ever pause in that lightning swoop of his to reflect whether his capture of a nesting linnet may involve the death from starvation of an entire brood of youngsters into the bargain? Does the average cat care so much as a hair of her whiskers whether her treatment of what she regards as her lawful prey will cause the poor little wretch an eternity of unnecessary agony? Yes; I know well enough that it is because they have not the faculty of reason, but surely that wonderful *instinct*, which teaches them to look after number one so well—surely you would think that it might also teach them to spare a thought *sometimes* for number two?

So with the various senses. It is for his own personal advantage, and his alone, that Nature has endowed each individual with the power of seeing or hearing, the faculties of taste, touch or smell. It is solely a case of how he himself, personally, may be affected by the element of discord, or of harmony, in the things perceived by those senses. With regard to the question of sound, we may notice here, as everywhere, how very true it is that one man's harmony is frequently another's discord. The voice of a jay, for instance, so excruciatingly harsh and discordant to the human ear, may sound excruciatingly sweet and harmonious to Mrs. Jay and all the little jays. The song of the robin or blackbird, so inexpressibly delightful to mankind, may sound inexpressibly horrible to the worm that he is about to devour. Dwellers in some of our out-of-the-way country districts will tell you that the incessant utterance of that quaint bird, the corncrake, repeated in twin monotones for five or six hours of the night without a single break, at the rate of fifteen or twenty to the minute, will drive many people nearly off their heads. And yet the chances are that the Master and Miss Corncrakes think it perfectly lovely. Come to that, I once met a naturally bad sleeper who swore that he could not have got on without it on a hot summer night—apparently found it such a pleasant variation from counting sheep, as they jump endlessly over the fence.



"SQUEAKING FURIOUSLY AS HE STANDS TO SHOW FIGHT"

So much depends upon the point of view—of hearing, one should say, perhaps, in this case. Even that prince of songsters, the nightingale, can at times become a positive nuisance. One is inclined to wonder sometimes whether the other birds, all sleeping the sleep of the just in copse and hedgerow, do not get fearfully annoyed at the selfish manner in which the nightingale thus appropriates the recognized hours of rest for the purpose of practicing his own special vocal gymnastics. As a matter of fact, it is probably very doubtful whether the other birds would even notice a nightingale, shouting at the top of his voice a couple of yards away. Their standard of values is so utterly different from ours. In their opinion the value of any particular sound is gauged solely by its power of appealing to the three great emotions which order their lives—love, fear, and anger. There is nothing in the song of the nightingale, for instance, calculated to frighten the other birds; nothing to arouse the amorous propensities of any but the lady nightingales; and nothing to excite their anger, while the faculty of admiration, oddly enough, does not appear to exist at all in the kingdom of Nature.

The uses of sound, then, might be roughly divided into two great classes—songs of love and hymns of hate. Upon these two hang all the law and the prophets—not forgetting the comparatively subordinate emotions of pleasure and pain, the sounds arising from which are usually of lesser importance and less frequently heard. Vocal expressions of pleasure among animals seem to be mostly restricted to a few species—the grunting of pigs, for instance, the joy-bark of dogs, or the purring of the cat-tribe. Turning to the feathered world, we shall find that there exists here a much stronger tendency to be talkative. Unlike animals, birds like everyone to know what they are feeling. Putting aside the question of cries of alarm—generally a different sort of note altogether from their usual one—these little creatures show a divine spirit of *joie-de-vivre* that has practically no parallel in the animal kingdom. Some of them are so happy that they are obliged to keep on talking about it all the year round. Thank heaven that they do! However black the gloom, however deep the mud, you will always find a robin ready to remind you in his musical little voice that there really are as good days in the year as ever came out of it.

Anger might be regarded as one of the most fertile sources of sound in the animal kingdom. Certain creatures, indeed, seem to have no sounds whatever in their vocabulary

beyond those which are produced by the sensations of annoyance or rage. The piercing, needle-like squeaks, which we so often hear in country hedgerows, may practically without exception be construed as a sign that one of those notoriously quarrelsome little beasts known as the shrew-mouse is at the moment hard at work biting one of his relations. If it be the case that other emotions possess but small power to open the mouths of most of our wild animals, it is equally true that you would have a long way to go before meeting with any couple that could manage to prosecute a quarrel in complete silence! Squirrels are continuously gurgling with temper, and a stroll through any sequestered woodland after dark would provide quite a revelation of what can be done in the way of bad language among the four-footed prowlers of the night. It would be interesting to know who was originally responsible for the expression *"dumb* animals!"

"THE SHREW-MOUSE BITING ONE OF HIS RELATIVES"

The sensation of pain appears to provoke less utterance of sound than any of its fellow emotions—oddly enough. You would think that *animals,* not being possessed of any idea of self-control, would be particularly noisy under the influence of pain, and I believe there to be quite a common impression that such actually is the case—an impression no doubt largely derived from experience of the fearful shindy that the average dog will kick up under the slightest provocation. A little reflection, however, would seem to invite quite the opposite conclusion, for wild animals are, as a rule, remarkably stoical under the influence of pain, although they will frequently make a terrific noise under the influence of fear—like the small child who yells before the hand of chastisement has even touched it.

Dogs are notorious cowards, though perhaps it is hardly fair to place such a highly domesticated creature in the same category as its wild counterpart. Innumerable generations of intimate association with mankind has affected the natural constitution of dogs to such an extent that many a one will yell if you merely raise your umbrella at him. I doubt whether an exhibition of that sort would have much effect upon a wild dog, unless it were to make him think you slightly mad! Similarly a horse, when wounded in battle, will shriek piteously; but a cart-horse has been seen calmly grazing in a field with a broken leg hanging helplessly behind. A lion or tiger, when wounded, will often make the forest echo with his roaring, but I would suggest that it is either fury that you have dared to wound him, or fear lest you may do it again, rather than the actual sensibility of pain, that should be held chiefly responsible for the sound.

Here is an instance nearer home that seems to point rather emphatically to the same conclusion. When shooting rats, it is sometimes impossible to avoid wounding one instead of killing it outright. In such a case, the animal may squeak at the moment of being hit, but not a sound will he utter during the process of dragging himself away in the effort to escape, although his pain must obviously be more severe now than at the moment of being struck. If cornered, however, he will usually start squeaking furiously as he stands up to show fight—proof again that fear or anger has more power than pain to unloose his tongue.

Or take the case of a young Japanese deer of mine which got entangled in some railings and broke her back in the effort to struggle free. Not a sound had been heard by anyone, and it was quite by chance that I found her lying there later in the day. Great, pathetic eyes looked up at me in mute appeal when I reached her side, but still not a sign of the agony that she must have been enduring—just a single, low groan when I stooped to free the tortured spirit with a handkerchief soaked in chloroform. An instance such as this carries additional weight for the fact that these particular animals are ready enough to whine like spoiled children if they think that one is the least bit late with their supper, while the youngsters will utter terrific yells if you pick one up.

So in the case of the feathered world—many a bird will give vent to the most ridiculous cries of alarm about nothing at all, but the same bird would lie at your feet with crippled leg or wing, and nothing but the agonized expression of its eyes to tell of the suffering endured. The records of science invite the assumption that the lower animals have not the same power of *realizing* pain as we possessors of reason. At the same time, it does strike one as rather curious that creatures so utterly incapable of self-control under the influence of other emotions—love, fear or anger—should yet show themselves to be so unexpectedly silent under pain.

And what about the insect world? Considering their prodigious numbers, we have much to be thankful for that the vocal powers of this department have been so greatly restricted! No insect possesses what could be described as a true voice, and very few of them can utter any sound beyond those caused by movement. Everyone knows that an angry bee will produce a different note from its usual contented hum, but it has also been discovered that a young queen-bee delivers herself of a peculiar piping noise on the occasion of her accession to the throne, almost as though she were trying to sing. One might pardon her, perhaps, for feeling rather elated at such a moment! It is a strange characteristic, by the way, of these communities, that the working bees are never allowed to turn their backs on the queen. Wherever she may wander about the hive, they have to keep their faces towards her all the time. I wonder if this can be the origin of the etiquette in our own courts of royalty? Mankind *has* been known before now to descend so low as to borrow a leaf from the book of Nature! It is interesting to notice that the ordinary bee hums on the note that we call "A" on the piano, but when tired it changes to the note "E." I once told this to a young lady of my acquaintance, and she spent the morning in the garden with a tuning fork, trying to discover which of the bees were fresh and which tired.

Of other insects which can utter deliberate sounds, the jolly little grasshopper is a good instance, the queer rasping sound that he produces being caused by rubbing one leg against the side of the body, a kind of love-song to his mate.

The author of this article is widely known not only as a botanist but as a writer on botanical subjects. When we asked him for a bit of biography we admit we were surprised to learn that after he was graduated from Pennsylvania State College, he remained as instructor in botany and football coach. "A rather unusual combination," Professor Hansen remarks. During the war he served as a flying instructor, interrupting his botanical work, with the government. Since 1921 he has been Associate Botanist of the Purdue University Agricultural Experiment Station.

Trillium, or Wake-Robin

By Albert A. Hansen

(PHOTOGRAPHS BY L. W. BROWNELL)

THE TRILLIUMS or wake-robins, of which there are a number of species, form a variable group of plants that range from unattractive purple blossomed species of repugnant odor to strikingly handsome pure white forms with fragrance of remarkable sweetness. Not only do the species differ greatly, but individual variation is not infrequent. It is by no means a rare experience, for instance, to find petals that have changed into green leaves, and occasionally monstrous big sepals occur among the trilliums.

It is not difficult to guess the origin of the name trillium, which comes from the Latin word *triplum* and means triple. From the same word we get triangle, trio, triplet and similar words. The name is quite appropriate since all parts of the flower from the sepals and petals to the three-parted ovary, are arranged in threes. Even the leaves agree with this plan since there is usually a cluster of three large leaves. The harmony of three is not spoiled until one examines the plant below ground where the root, instead of being three-parted, is elongated, large and fleshy. It should be stated, however, that unusual forms occasionally develop in which the leaves or the parts of the flower have increased in number.

However appropriate the appellation trillium may be, the same cannot be said for wake-robin, a name commonly applied to this genus of plants. It alludes to some of the earliest blossoming species which bloom in soil still moist from the melted snow. These early trilliums appear with the first robins, which they are supposed to wake into spring activity, but as a matter of fact most of the trilliums do not bloom until long after the return of the robins and it is more a case of wake-trillium than wake-robin.

The earliest of the trilliums is the dwarf white trillium, an attractive, showy white-flowered species found in woods and thickets from Pennsylvania to Minnesota and southward to the latitude of Kentucky. In common with most species of trillium it prefers rich, moist soil. Each plant produces a single pure-white blossom that in turn forms a three-lobed, globose and reddish berry.

A SINGLE PURPLE TRILLIUM

Its odor is like that of carrion. Note that the leaves, sepals and petals occur in threes.

After the delightful little dwarf trillium has bloomed, the rather unpleasant purple blossomed species make their appearance. First comes the purple trillium with its carrion-like scent and with flower color that reminds one of old meat, although the dull dark-purple occasionally fades to pink and more rarely to white. It may be found in rich woods from southern Canada to North Carolina and Tennessee. The purple trillium is a common species in the vicinity of Washington, D. C., where its unpleasant odor makes a poor impression among visitors familiar with the more attractive forms. It

THE LARGE-FLOWERED TRILLIUM

This is an attractive, late-flowering species, with pure white petals gradually become rose colored with age. It is commonly cultivated.

is said that the color and odor, suggestive of putrid meat, serves to attract carrion flies, the type that one finds hovering around animal carcasses and butcher shops. Whether or not the carrion insects assist in pollination is not definitely known. The color of the blossoms vary from purple to a muddy pink and occasionally to dull green.

Along with the purple trillium comes the stemless or sessile-flowered species. Although the flowers are usually purplish, the stemless trillium is an improvement on the purple trillum in that the odor is far more agreeable. Varieties with green blossoms may sometimes be found growing in deep shade. In common with the purple trillium, it prefers rich moist woods and thickets and the flowers appear during April and May. The flowers, however, persist longer than the blossoms of any other species. The stemless trillium is distributed from Pennsylvania to Minnesota and southward almost to the gulf. Following the purple-blossomed trilliums there appears a succession of far more handsome and attractive species that is led by the beautiful nodding trillium, one of the most familiar species in the northeastern quarter of the United States. The pure white or pink blossom nods bashfully on a curved stem. So modest is this flower that it is sometimes almost completely hidden under the leaves. About the same time one may expect to find a similar species with larger, bolder upright flowers. It is the large-flowered trillium and, as the name suggests, the flowers are among the largest to be found in the trillium tribe. White at first, they turn pinkish later on, as though ashamed of advancing age. A two-leaved variety with gigantic flowers was discovered by Dr. Pitcher in the woods of Michigan. The strikingly handsome flower is later replaced by a round black berry. The large flowered trillium is the species commonly found in cultivation among florists and gardeners. A charming characteristic of this plant is the manner in which the fully expanded petals gradually curve backward in a most graceful manner.

PAINTED TRILLIUM IN FRUIT

This flower has many advocates of its adoption as a national flower, and it certainly is outstanding in beauty.

Among the last of the trillium tribe to appear is the gorgeous painted trillium, so called because each wavy-margined bright-white petal is blotched with a V-shaped crimson spot as though someone had marred its chaste beauty by spilling red wine on the petal-base. The painted trillium presents the unusual combination of being the handsomest and most abundant of its kind. The species may be found in cool, moist woods, particularly near stream banks, and in bogs from Maine to Wisconsin and southward to Georgia and Missouri. Like the large-flowered trillium, it is a sociable species since it usually grows in colonies and is not ordinarily found singly. The beautiful blossoms appear during May and June and by September each flower has been supplanted by a bright-red three-angled berry.

The pollination of the trilliums is somewhat confusing. The purple-flowered species are at best rather imperfectly cross-pollinated by the carrion insects and many of the flowers are probably self-fertilized. In some of the brighter-colored forms, the pollen is ripened and shed before the stigmas become receptive and self-pollination is thus largely prevented.

The painted trillium has many advocates who aspire to have it adopted as the national flower. The plant is native, fairly abundant and unquestionably one of the handsomest and most attractive of our wild species with almost unrivaled beauty of

ONE OF THE FRAGRANT TRILLIUMS

This is the stemless trillium, a purple-flowered form. The stemless flowers are well pictured in the illustration.

flower and foliage. The greatest drawback, however, is the fact that the short, thick, fleshy root has long been held under suspicion as being poisonous, which would hardly be proper for a national flower. Furthermore, even the berries are accused of possessing poisonous properties and Dr. L. H. Pammel warns us that they should be regarded with suspicion. The common name three-leaved nightshade, sometimes applied to the trilliums, alludes to the suspected poisonous properties.

The fleshy roots, with which practically all the trilliums are equipped, are strongly emetic in action. The root of the large-flowered trillium is rich in a principle technically called trillin that has found use in medicine as an emetic.

Taken, altogether the trilliums comprise a group among the most interesting of our early summer flowers. The triple arrangement of their parts renders them easily recognizable despite their minor variations in form and color, and each season we hail with gladness their certain recurrence. A well-beloved writer named one of his earlier books after these flowers, for, as he says, their appearance marks the arrival of all the birds.

THE NODDING TRILLIUM

It gets its name from the manner in which the flower stems curve, causing the blossoms to hide bashfully under the leaves.

Something New in Bird Houses

By Marie Dickoré

WHEN is a bird house not a bird house? When the entrance is not built properly, you may say, with good reason. But suppose the bird house was good to eat but not livable? After you read this you can decide for yourself whether it is a bird house.

Mrs. William F. Doepke of Cincinnati is a lover of birds and a sincere hostess to her feathered guests. She has always provided them winter fare, but this last year her niece and nephew, Miss Augusta and Mr. Carl Margedant, helped with something new in bird feeding stations. It stood in the gardens, an invitation to passing birds.

The house was about four feet long and three feet high. The central portion consisted of a huge cake of cracklings and the entire roof was covered with lard, poured on while hot and then thickly sprinkled with sunflower seed and other grain to make it look like a shingled roof. Pop corn on the cob and slices of pumpernickel were used to decorate the front of the roof, and the little gable window had a broken pane to allow the little squirrels and blue jays to reach in for peanuts and other nuts stored in the "attic" of the mansion.

A BIRD HOUSE THAT'S GOOD TO EAT

Perhaps it may not be a bird house in the strictest sense of livableness but it certainly is one, just the same.

Paraffin was used to construct the window panes, while cocoa can lids formed the window boxes, which were filled with real shrubbery made from a Cumberland Mountain evergreen, the flowers being of gum drops, pink, to resemble rambler roses and geraniums. There was a lovely vine of these rambler roses growing over the doorway, which was made of the same spicy bread as the gable trimmings. Other flowers growing in the garden were made from raisins colored red with cranberry juice. The lawn was strewn with cracked corn and other grain dyed green with spinach, while the rustic seat and the welcoming sign over the doorway were pieces of cuttlefish bone. The stoop and paths of flagging were cakes of lard containg broken nut meats. What a happy home for birds.

Here is the first article from Paul Griswold Howes, written specially for NATURE MAGAZINE *at the Jungle Biological Station in Dominica. The second article on some remarkable wild life dwellers will appear in an early issue.*

To the left is pictured the laboratory and headquarters of the Station where Mr. Howes and his colleagues have been carrying on their work. Mr. Howes reports that the results of the research work have equalled the hopes for them.

First Acquaintances At Dominica

By PAUL GRISWOLD HOWES

(PHOTOGRAPHS BY THE AUTHOR)

TWO DAYS after arriving at Roseau, the little capital of the wonderful Island of Dominica, we were on our way up the mountains to inspect the site of our Jungle Biological Station.

We had been received in the capital with open arms, and from the smallest to the highest official we found nothing but the warmest hospitality. Everyone desired to aid us in our work, and favors were showered upon us from all sides. All this warmed our hearts and sent us toward our mountain home with a new enthusiasm, and a will to make our station worthy of the expectations of the splendid people that we found awaiting our arrival.

Dominica is the most beautiful and the loftiest of the Leeward group of the West Indian Islands. It lies as a mass of rugged, jungle-covered mountains rising from the sapphire Caribbean, fifteen miles north of Martinique and twenty-five miles south of Guadeloupe.

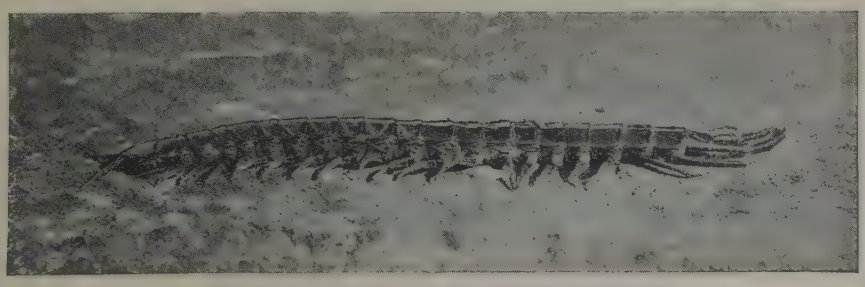
Its loveliness is a drenching beauty that is beyond the power of description. In the Indies one becomes accustomed to the marvels of their mountains and jungles, and the flowers that are nowhere else on earth. Dominica possesses the best of each of the other islands in its scenery. To the naturalist and lover of all that is beautiful in this world, Dominica is the fulfillment of an ideal.

Nine miles up a twisting trail called the Imperial Road, and some two thousand five hundred feet above Roseau, we come to Corona House. It nestles upon a steep hillside, and consists of four rooms built under as many gables, and an annex for servants' quarters. All about the house grow roses and crotons, bougainvilleas and treeferns, violets and oranges, grapefruits and vanilla, and the strangest of strangers side by side! In the rear and at the sides of the clearing, the great forest shuts it in, but from the high front veranda one looks away for miles to the soft gray-green and blue of a mighty range of hills, topped by cloud-draped abbatre Bois and the sharp-pointed Trois Pitons.

This is our Jungle Station. Over us sweep the mountain storms, pouring their deluges upon us. Winds howl about the house at night, but they are playful rather than angry. In the morning they subside and while we hear the torrent of rain rushing down the mountain streams, the storms pass off to sea and we are bathed in tonic sunshine.

Here in the mountains, three hundred inches of rain falls each year! Twenty-five feet of water every twelve months, yet we are perfectly comfortable and the earth and trees soon dry off after a shower. Almost ideal, one would say.

Things began to happen at once upon our arrival. The owner of the house was away, but this kind Captain Robertson had sent us a radio to use his own home nearby until his return. This of course we could not think of doing, so into Corona we moved with all our



ONE OF THE FIRST TO WELCOME THE PARTY

A centipede seven inches long. They are very common and although their bite is painful it is not at all dangerous.

paraphernalia. In a few hours a laboratory commenced to take form, a dark room was improvised, servants installed, bedrooms made ready for use and supplies of all kinds stowed away in their proper places. Last, but not least, a pipe was arranged to catch the rainwater from the roof in a huge barrel, and the Jungle Biological Station was an established fact!

Almost the first find of interest was a huge centipede seven inches in length near the door of the darkroom. As I picked him up in a pair of long scissor forceps, he whirled about like a flash of lightning, lashing and stinging the steel fingers that held him captive. His strength could be easily perceived and soon he had wiggled out of my grasp and made off, a rather repulsive but thrilling sight. In a bottle with some chloroform, the creature refused to die, and it was only after a considerable period in a cyanide jar that he at last lay quiet in death. Centipedes are quite common here under logs or stones, and although their bite is painful and causes a large swelling, it is not at all dangerous.

CHAMELEONS OF THE NEW WORLD

Many species of Anolis lizards were found, beautiful little fellows with interesting color changes.

All about the house, but only in the day time, we find a variety of Anolis lizards. These beautiful little creatures are the chameleons of the New World, although they are in no way related to those of the Old World. They change color quite completely under certain circumstances.

When first captured they turn color from fright, but under normal conditions remain yellowish green, with more or less intricate patterns of darker shades upon their backs interspersed with dots of brilliant green or red. Just how many species we have, remains to be determined later. Some occur in the house, some among the foliage of the forest, and other brown ones among the boulders of mountain streams, or upon the leaves of the forest floor.

The color changes of these lizards are entirely due to such stimuli as fear, temperature, sleep, excitement and the like. The substance upon which one of them may be resting has absolutely nothing to do with their color, although it would often seem so, and this has long been the popular belief.

In the males, the skin of the throat forms a fan-shaped projection which is probably of use during courtship, as an ornament. The males fight violently at times and during these combats their movements are incredibly rapid and the affairs are very amusing to witness.

Another fellow that lives close to the laboratory and whose acquaintance we made during our first week's stay, is a moderately large species of Skink, a member of the lizard family of Scincidae. Skinks are at once distinguishable from the other lizards by their smooth scales, and very glossy appearance. Our particular friend is strictly diurnal and the fastest mover in the neighborhood. He basks in the sunlight whenever it shines, and appears quite off his guard. Make a step in his direction, or raise your hand ever so slightly, and off he darts to his special retreat. Skinks' eyesight is remarkably acute and their eyes will follow a distant object as you move it back and forth.

A STRANGE BAT WAS FOUND

Its lips were big and fleshy, its head quite pig-like and its black tail was most remarkable.

The only one we have found so far—that is to say, the only species—is black and brown with greenish-yellow stripes running lengthwise down its body. Shining through these ground colors is a beautiful opalescent sheen, so that the sleek creatures really glisten in the sunlight.

Both of the types of lizard that I have described lay small, white eggs, from which the young hatch out in a comparatively short time. Such eggs I have found under stones and chips, or buried in shallow earth. The young lizards are exactly like the old ones except in color. All of them feed mainly upon insects, but centipedes and spiders and other crawling things are also accepted readily.

Just before dusk—and this comes very rapidly in the tropics—we heard a peeved squeaking and twittering somewhere between the eaves or

walls of the house. We knew it at once for the waking talk of bats, making ready to fill their empty stomachs after their long day's sleep.

SKINK, FASTEST MOVER IN THE NEIGHBORHOOD

This species is distinguishable from other lizards by its smooth and glossy scales. Skink has an eye that seems to miss nothing.

Looking all about the veranda, I found two tiny cracks between the ceiling and a roof-timber, and here was the entrance to the bats' palace. Obtaining a butterfly net, I waited patiently beneath. It was almost dark, when, after much noisy conversation as to the advisability of the thing, a tiny head with pointed ears peered out at me. It retreated at once, but was soon followed by others. Then one of the bats decided to leave for the evening. It pushed itself out, and pulled its body downward with the hooks upon its wings, then it dropped like a shot, spread its wings, dodged my net and was gone. Another one avoided my trap in the same manner. Like lightning they moved, noiselessly, with the ease of a shadow. Finally after some effort, I swooped successfully and a bat lay tangled in the net. With the eagerness that always accompanies work in a new country, we unfolded it, and there to our astonishment was a creature as sooty brown and black, as its dark hole in the eaves. Its lips were big and fleshy, and its head quite pig-like, vastly different from another yellowish, long-headed species, that had entered the house the night before. Most remarkable of all was its black tail, as round and mouse-like as a tail could be.

Here was a bat unlike any that I had seen in all my tropical experience, living in the same house with us. That is what we call good fortune, but I suppose many would not agree with us!

There were at least eight individuals in the den in the eaves, and some young ones also. At night after the old ones had left for their first meal there would be dead silence for a time, but presently we would hear a low fluttering, and then squeaks and those inimitable sounds that bats make. Gradually it dawned upon me what all this meant. The old bats were coming back to feed their little ones, just as a dog comes back from its rambles to its litter of pups. A mother bat cannot feed her little ones indefinitely if she does not partake of food herself, and so when the glad hunting of starlit night began, so the meals of the youngsters became better and more frequent, and all the bat household ran smoothly.

At length, they would settle in for sleep, and all would be silent until another twilight awakened them again.

Upon close inspection of the captured bat I found a tiny species of fly parasitic upon it. This fly was intensely interesting, although but the size of a pin head. Through endless generations of associating with bats, the species has become vastly altered from an ordinary fly. Its body is flat and its legs tick-like, and well hooked for clinging, during aerial excursions, at the bat's expense. I suppose it bites the bat, too, but why not? We are all bitten more or less, and everything must live its life. This little fly has chosen a wild riding existence that would put the most insane acts of a speed maniac to shame. Every stunt of the air-man is old stuff to this little fly, and, besides, he rides fearlessly upon a great machine that would eat him for fuel if it could reach the mite. Hats off, I should say, to a great little fly!

Such are a few of our new found friends at the Biological Station. All these and many more in a week. If this is an index of what is to follow, we shall be busy indeed as the weeks roll by. Already we have accumulated enough new and interesting facts surely to fill a small volume.

Mushroom Rocks

By Lola R. Carr

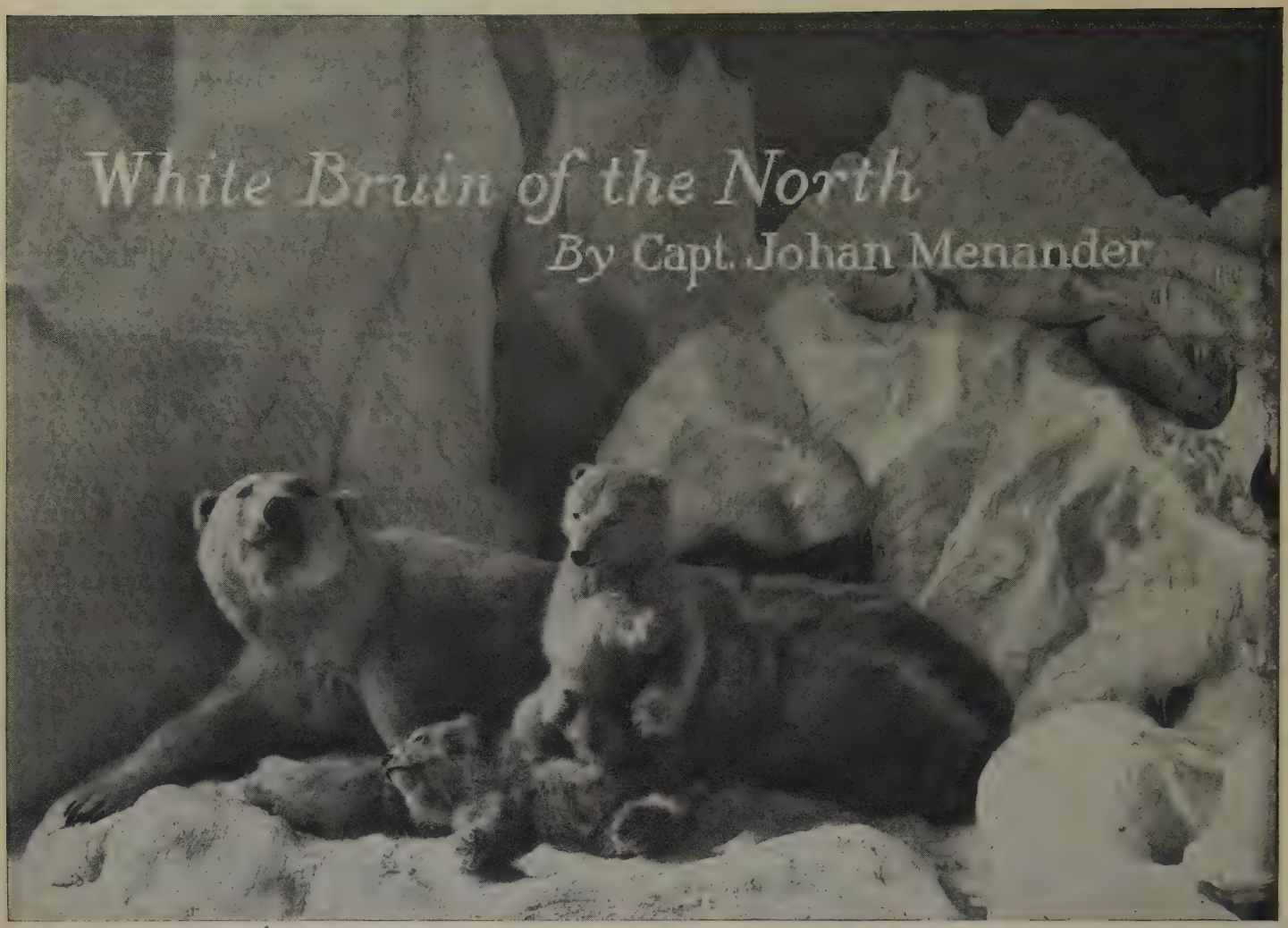
ON THE plains of central Kansas, in that region of the United States noted for its tablelike smoothness, rise two gigantic, mushroom-shaped rocks, known as The Mushroom Rocks. In striking contrast to their surroundings they rise respectively fourteen and twenty feet in height above the level plain.

These rocks are composed of sandstone, the softer lower parts being capped by a harder stratum which has better withstood the eroding effects of ages of storm, wind, sun, and frost, the combined effects of which have almost worn away the supporting columns. Indeed, the rounded rock-masses seen on the ground near the up-standing "mushrooms" are evidently the cap-stones of similar eminences from which the supports have disappeared. These rocks are to be found near the town of Carneiro, Ellsworth County, in the central part of the state, and not far from the geographical center of the United States.

Many are the speculations as to how these rocks came to find a resting place in Kansas. The answer is written in the history of the ages, many pages of which are still difficult to read, even for the scientist.

White Bruin of the North

By Capt. Johan Menander



COURTESY AMERICAN MUSEUM OF NATURAL HISTORY

YOU HAVE seen him in pictures and in the zoos. He is a melancholy-looking fellow, his head continuously wagging from side to side, his white coat often streaked with a rusty color. But if you have not seen the polar bear in the glorious sunlit Arctic wilderness, you have not really seen him. Impressive big brute he is, yet seeming puny across the ice against the background of ridges and hummocks. Beautiful with his white pelt, this northland bruin moves in graceful and long easy strides across the land. As he shifts his paws he seems to push forward the shoulder or hip with a gait that is almost snake-like. Like man he walks on the soles of his feet. Frightened into a lumbering gallop, he loses some of his serene dignity as his broad hips go bouncing up and down, but once out of sight behind an ice hummock you forget the momentary ridiculous appearance of Nannook.

The polar bear is the undisputed monarch of his icy realm, but I have seen him forget his royal dignity and behave like a playful puppy dog. Early in the summer of 1902 a lonesome bear was wandering about amongst the islands of Franz Josef Land, when he ran into a refuse heap that had accumulated during the winter at the side of S. S. *America*. The ice in the bay had broken up a day or two before, and our good old ship was once more free from the icy grip that had held it imprisoned for eight months. But the ice with the refuse on it was still in plain view from the vessel. As the bear investigated the rubbish, he found a pair of well-worn trousers that had been discarded by some member of the crew. Bruin, apparently having nothing to worry about for

PHOTOGRAPH L. W. BROWNELL

HIS GAIT IS ALMOST SNAKE-LIKE

When the polar bear walks he shifts his paws by seeming to push forward the shoulder or hip.

the moment found a new use for the old garment. He threw his toy high into the air, jumped at it, and caught it on the fly in his mouth. He sat on his haunches and shook the old pants with a well simulated fury. This play kept up for more than half an hour, until the trousers had outlived their usefulness, even as a plaything.

The polar bear is found all over the Arctic, where he roams over the ice in search of his food. He makes frequent visits to land, where luscious eggs are found in the early summer, and individuals have occasionally been found on Iceland and the northern coast of Norway. Edward Sabine once saw a bear swimming in the water forty miles from land with no ice in sight. In this case I think that the animal had been marooned on some ice floe that had drifted away and afterward melted under him.

PHOTOGRAPH INTERNATIONAL

AN UNDISPUTED MONARCH

Yet, on occasions, he will forget his dignity and behave like a playful puppy dog.

It is claimed that the female bear hibernates. I have not been able to confirm this statement, and I doubt that the retirement of the females really can be compared with the winter sleep of the land bear. The young, generally two, are born during the winter, and if they are like those of the land bear that I have seen, their mother simply can not leave them alone for one single minute during the first two or three months of their life. The young of the European bear, at least, are born hairless and blind, and at birth they are no larger than kittens. Their eyes do not open before they are five weeks old. If the newly born polar bears are as helpless as their European cousins, they would immediately freeze to death if left alone even for a short period. I therefore think that the mother bear retires for the sole purpose of caring for her offspring.

The young grow very slowly and they stay with their mother until they are about two years old. The mother love is highly developed in the polar bear. I have frequently seen females followed by young of different age, in which case one of the litters must have been adopted.

A scene that I witnessed in the pack ice east of Spitzbergen is one I shall never forget. I had watched for some time from the crow's nest of my ship a family of mother and two young, meandering over the ice. The grown bear occasionally would climb a hummock and from this elevated position scan the surrounding territory for food. At times she would rise on her hind legs in an upright position to get a better view. Finally she located a seal, fitfully sleeping on the edge of an ice floe, about half a mile from the ship. The mother seemed to hold a conversation with the cubs, instructing them to lie down and keep quiet, while she went away to get their dinner. The two little ones did as they were told, and the old lady sneaked up towards her prey. Youth, however, is impatient, and the cubs could not restrain their curiosity for long. First one of them stood up and then the other. The mother apparently knew her babies, because I noticed that she several times looked back to see if they were behaving themselves. When she caught them in their act of disobedience, she immediately returned and cuffed them about with her forepaws. I don't doubt she gave them a sound scolding, and promised them a real thrashing, if they forgot themselves again.

THE POLAR BEAR AVOIDS MAN

He does not deliberately attack unless wounded or taken by surprise. Man is usually the aggressor in instances of fatality.

The cuffing apparently had the intended effect, since the little ones stayed put. The mother again advanced towards the seal, crawling on her belly, and taking advantage of every hummock that offered cover. The closer she advanced towards her prospective meal, the more cautious she became. The color of the polar bear resembles that of the snow and when motionless or moving slowly over the snow-covered ice, the bear is practically invisible, except for the black tip of the nose. The bear is fully aware of its conspicuous nose, and I noticed that as often as the stalking animal was in plain view to the seal, she covered up the nose with one huge forepaw, slowly pushing herself ahead with the hind legs. Finally she slid off the ice into a lead, dived and swam under a cake of ice to emerge from the water, and with one mighty

PHOTOGRAPH INTERNATIONAL

TEMPERATE summers are not things of joy to the polar bear, whose real home is anywhere in the Arctic where he can roam the ice and rear families.

PHOTOGRAPH INTERNATIONAL

"HE is a melancholy-looking fellow in captivity, his head continuously wagging from side to side, his white coat often streaked with rusty color."

spring appeared in front of the terrified seal. One swing of the powerful paw was sufficient to assure dinner.

The staple food of the polar bear is the seal, and to judge from the amount of fat or blubber that is found under the skin, the bear does not go hungry for long. Bears are often found feasting on carcasses of white whales or walrus and seals that have been killed by hunters, and they do not seem to mind if the meat is a little seasoned. One authentic story tells of a great number of bears, feasting on some walrus that had been killed the previous year, were surprised by the crew of a Norwegian sealing smack. Before the bears could disperse, not less than twenty-five of them were killed.

The polar bear, like most other wild animals that have come in contact with man, carefully avoids him, and does not deliberately attack, unless wounded or taken by surprise. There are many stories of men killed by polar bears, but in all that I have sifted, man was invariably the aggressor. When a bear walks towards man, he does so from ignorance or curiosity, and not because of hatred or malice.

The polar bear is ruthlessly hunted for its beautiful pelt, and I could not help thinking what a crime it is to kill this splendid beast, when last spring I read in a daily paper that untanned polar bear skins had been sold wholesale on the New York fur market for ten dollars each.

Bear steak is very palatable, and I can say from my own experience that it is a welcome change in the Arctic diet. The lucky ending of a bear hunt has saved the lives of many Arctic explorers, not to mention the Eskimos. It is almost certain that none of the members of the Greely expedition would have returned home, but for a bear that was shot a few days before the party was found and rescued by Schley.

Polar bears are still plentiful in the practically inaccessible parts of the Arctic regions, but the day undoubtedly will come when Arctic hunting excursions by airplane will be arranged. Then "sportsmen" will be able to shoot a brace of polar bears with more ease than they can secure as many quails, and the white bruin of the Arctic will know the same struggle as others of our birds and mammals.

The Blood-Stained Cockatoo

By Edward A. Preble

THE blood-stained cockatoo, which is found over much of Australia, is so called because its otherwise white plumage is relieved by a few rosy feathers about the neck and face. The beautiful white feathers, however, are almost always more or less stained with dirt, for the bird feeds almost entirely on the ground and digs a great deal for roots and other food. Like many parrots it loves to strip the bark from the branches of trees and frequently betrays the location of its nest by this habit.

This parrot, after the habit of many birds which inhabit semiarid regions, nests in the wet season, mainly in August and September, the late winter of the Southern Hemisphere. A hollow in a tree is its first choice, but in case one is not available, it will content itself with a cavity among rocks or the broken top of a large ant-hill. No nest is made, the eggs, two to four in number, being laid on the floor of the unlined cavity that serves as a home.

A STRIKING MEMBER OF THE COCKATOO FAMILY

Its otherwise white plumage is splashed with rosy feathers about the neck and face, giving it its name.

Many birds have the habit of appropriating the nests of others that they can overcome. As a rule, however, such interlopers clear out the original home before setting up housekeeping themselves. Now it happens that among the parrots of Australia is a well-known one, the galah, gray and pink, which is commonly captured and sold as a cage-bird. The galah also nests in hollow trees, and usually lines the cavity with leafy branchlets. Frequently the blood-stained parrot will drive the galah away from its chosen hollow, and use it for its own nesting. If the galah has already laid its eggs, however, the robber will make amends by leaving intact the eggs of the deposed bird, and after laying its own, will hatch out both sets, and bring up the combined brood. Possibly there is a method in this. Bird parasites generally destroy the young of their host, but the cockatoo, however, by sparing these, increases the chances for its own tribe for future profit.

The Mourning Dove

By Gayle Pickwell

(THIS ARTICLE IS ILLUSTRATED BY A FULL PAGE INSERT IN COLOR FROM A PAINTING BY R. BRUCE HORSFALL)

THE mourning dove was a weather prophet to the folks of my boyhood home for his notes were "wet weather soon, soon, soon." Thus considered the soothing notes, however mournful, were optimistic, for rarely did it rain too much on those Nebraska plains. It seemed to me, however, that the mourning dove promised wet weather most lavishly *after* a rain and not *before* it. In that respect the mourning dove did not differ one whit from the rain crow himself for these two birds did most of their prophesying when they stood no chance to lose. But the prophecies are, after all, only love notes and the love notes of all birds come most freely in the fresh air and under the bright sky that follows the rain.

The mournful notes of the mourning dove are, most assuredly, not mournful to his mate. They are notes of ecstasy. When the beautiful, iridescent male stretches out his neck and stiffens it, puffs up his chest and throat and then tilts gracefully his head with each note, he is asking, "Whoo-ah, who, who, who," quite deliberately with gentle pause between each "who," expecting only one answer. That answer should be a gentle and assuring "You-ah, you, you, you." But since his mate never answers, he, in all confidence, answers for her.

The mourning dove's song is probably not completely satisfactory to himself, for he has, to supplement it, a wonderful love flight. When that urge is on he launches into the air and, with wide, deep wingbeats that clap his pinions together beneath his breast, mounts up and up, his primaries keeping time with a staccato whistling. Having reached his altitude, down he comes in a long, graceful, spiralling glide, with wings quite rigid, to alight again with whistling flutter at the point from which he started. It is said that the female indulges in the glide as well. Perhaps that is her answer to the "Whoo-ah, who, who, who."

There is another note that the mourning doves have, and that is the whistle of their wings while in flight. Somehow that note is part of the bird, for the clean and rapid passage of a dove overhead would leave one unsatisfied if the air did not carry the whistle to your ears. Having once heard it and identified it, one need not look for its author thereafter, for that whistle note can spell nothing but "mourning dove."

I believe there is no native bird which attempts to equal the mourning dove in domestic accomplishments. Its breeding season extends from early May until late September, and, if fate is lenient with the frail establishment of the bird, three or four broods may be raised to maturity with scarcely a pause between each family. I watched young doves leave a nest on August twenty-fifth thinking that this was surely the last of the season's duties, but on August thirty-first new material was being carried to the nesting site, and on September fourth, with two new white eggs, the female was brooding again, while the male sung his pensive love note or made large flights up to slip back in curves to earth again.

PHOTOGRAPH WILLIAM L. AND IRENE FINLEY

MOURNING DOVE NESTLINGS

The mother dove broods her young almost constantly until they are ready to fly away from the nest.

The male dove does more than coo and make love flights. He relieves his mate at brooding duties and it is he who carries up most of the nesting material. The building of the mourning dove's nest is not an arduous task, however, for an hour or two of labor on three or four successive mornings suffices.

The nest is the frailest platform one can imagine, built of such material as may be convenient or nearest. Straw will be utilized almost exclusively if it is handy, and the material of a newly-cut lawn, still green, will do as well. With no lining and the shallowest of cups, these nests of the mourning dove suffer severely in every storm, but they are too easily replaced for their loss to damper long the optimism of the birds that build them.

A pair of doves nested in the grape-vines of our porch one year and I watched them closely at their labor. This, their second nest, was placed within six inches of the former, and it was not over two feet above the heads of the inmates of the house as they passed in and out. But the doves, timid as they often are, could not resist the temptation of so perfect a homesite with its secure foundation and its canopy of leaves.

PHOTOS PICKWELL & MIDDLETON

EGGS AND YOUNG DOVE

The nest is roughly built by both mother and father bird.

Within six days of the departure of their previous family the parent doves were at work upon the nest for a second brood. Each morning for two or three hours they worked and then spent most of the remainder of the day side by side in the growing structure. The male dove fetched in the material, pausing frequently in his searching to sing his mournful love song with closed beak and stiffened neck. To the female the material was given, and she placed it, picked it up and relaid it, with a care that merited a better result than just a meaningless pile of sticks. Having placed the material she strode upon it, turned and settled in it, and so busied herself with bustlings and rustlings that the male would be back with more material—despite his pauses for love notes—before she had done with the previous lot. Three mornings the doves worked thus, piling sticks upward like a casual stack of kindling wood, and on the fourth day I found a new white egg in the depression of the center.

In cosmopolitan tastes for nesting sites the mourning dove is without a peer. Even the ubiquitous robin scarcely approaches its record. The early spring nests are placed almost exclusively in trees, five to fifteen feet high. Evergreens, at this season, are given the preference, for they have an unusually large number of flattened branches upon which to pile up the twigs that make the nest. When the farmers' grain is cut many doves rear their second and third families on the ground in the stubble, thus placing them convenient to a happy food supply. Robins' nests, having launched one family into the world, do another turn for mourning doves in August.

At my old home they nested in the porch vines and one pair, having supreme optimism, or lacking the elements of discretion, nested in the eaves trough of the upper roof. An eaves-trough nest is a big gamble even for a bird-game where chances are always woefully numerous, and the first attempt was a sorrowful loss. The rain had relented until the nest was built, the eggs were laid, the young were one week old, and then the downpour came. The second attempt — foolhardy birds! — was more successful, since it was made in August, and in Nebraska. One bird reached maturity. But on the lower roof, like a beach strewn with the wreckage of its storms, I found, weeks afterwards, a few scattered straws and sticks and, full proof of the folly of nests in upper eaves, two pitiful, small, dried skeletons.

The mourning doves have no scolding notes, but like the sandpipers and plovers have a more remarkable defense for their nest than aimless flutterings and noise making. The brooding bird sits tight until you, unsuspecting, approach within a foot or two, then she goes with a rush and a flutter that sends your heart into your mouth. To the ground the bird drops and what a limping, fluttering and distress she there displays! It takes years of training on the bird stu-

dent's part to resist (no boy ever resists) the temptation to run and catch the wounded bird. But when you arrive the bird recovers sufficiently to flutter on away and when you race after she gains new health with distance, the distance between you and her nest, until finally her recovery is assured by your complete enticement from her treasures. Then off she goes, entirely out of sight that you may soon forget her,

AN EAVES TROUGH NEST IS A GAMBLE

Here is a young dove in a dangerously uncertain home. Two young birds of the previous brood were washed away.

or else alights on a distant tree to watch anxiously your passing.

The ornithologist has no adequate explanation for this distress similitude that so many birds exhibit. It seems so intelligent an action in birds otherwise poorly endowed. Yet it is not intelligence at all but instinct (and hence the more wonderful), since it is a complicated trait which evidently appeared in some remote bird ancestor, no one knows how or why. It is now passed on and on by a benevolent Nature because it saves the young of those birds who have the reaction and they, in turn, use it and hand it on again.

The simulation of distress was preserved, perhaps, because it first saved the young from cats and dogs and many of the early enemies of birds, but it is useful, just as well, against the young of man. In this respect the mourning dove displays it better than any other birds. Just once, as the nest is deserted, is the play enacted and then the deluded intruder is left, baffled, to turn his thought to other things. But the killdeer, for instance, if you remain near the nest, will return time after time until the suspicions of the dullest are aroused and the nest is finally given away because the game is overdone. Here at least the mourning dove seems wiser.

The dove broods her young almost constantly from the time they hatch until they fly away. Even with the thermometer at 100° F. in the shade the young birds are hovered by the parent. This habit surely arose when the dove nested more consistently upon the ground and the young needed shelter from the sun; but now that doves have been forced by increasing enemies, and man, to nest almost exclusively in trees, the habit still prevails like an old and almost forgotten style, some heirloom of inheritance, persisting into later generations. Yet the dove's methods are above question, for, barring winds which sweep away the frail nest, and cats which may make the easy climb, the young doves live, prosper and grow.

How they grow! There are but two birds at most in the nest to care for and they are fed, crop full, at a single feeding, by the material directly from the crop of the parents. How helpful such a method! What countless trips it saves! A few feedings at most suffice for the day, and the remainder of the time can be spent in hovering the young. Then when that is tiresome there is the mate who in all consideration comes in, coos a bit in greeting, and lets the female bird fly away directly that he may take his turn.

When August comes the broods of earlier nestings collect in little flocks and glean the stubble fields and work the

PHOTOGRAPH BY THE AUTHOR

THE MOURNING DOVE

To the people of the plains the "coo" of the dove was a sign of wet weather and hence the bird was regarded as a prophet.

meadows over. As evening falls they come into the pines to spend the night. Long shadows are crossing the yard as the evening cicada sings "iree, iree, iree, iree, ireeeeee," trailing off, each song, to the death of Iree for the day is also dying. With their song the wind goes down to leave a hush upon the plains. Then the little flocks of doves, as they seek their nightly quarters, keep accompaniment to the music of the evening cicada with the whistle of their wings. With the coming of darkness all is quiet and serene in dove-land.

Mrs. Whitley, the author of this article, is chairman of the Forestry Committee of the General Federation of Women's Clubs and a leader in the Outdoor Good Manners Campaign

When you are through eating at home do you throw the plates in the corner, brush what you have not eaten on the floor and burn the tablecloth? Remember that the outdoors is ours also

OUTDOOR GOOD MANNERS

By Mrs. Francis E. Whitley

DID YOU ever go to the woods with happy anticipations of golden hours out of doors, only to find your favorite nook defiled with the refuse from the last picnic, flowers torn up and perhaps a campfire still smouldering? Why work for the preservation of natural scenery? Why urge the creation of parks when often the use of such privileges suggests that a little shade and a trough might more fittingly be provided?

Dwellers along the great highways especially in the scenic portions of the country or near the centers of population, find conditions increasingly intolerable. It is not alone tourists and campers, but even many respected citizens, old and young, of almost any community who seem to suppose that enjoying the freedom of the open means throwing aside all decent regard for the rights and property of others. All outdoors is the prey of light-hearted vandals who break down dogwood branches and strip the roadsides of every lovely blossoming thing.

A Virginia editor speaks of the wealth of azalea and laurel which used to make the highway leading south from Staunton a vision of loveliness. This beauty is now steadily disappearing through the depredations of the motoring public. Some of us hope to live to see the day when it will be considered decidedly "bad form" to be seen in an automobile loaded with spoils of woods and roadside.

This "Outdoor Good Manners" movement was launched by the forestry committee of the General Federation of Women's Clubs in the spring of 1925. It is an attempt to offer something which may gradually help to check the tide of thoughtless vandalism. The effort is to educate the public, beginning with the children, to realize that this national habit is *not* a slight and negligible failing. It seeks to teach that to abuse the hospitality of parks and forests is just as really a breach of good manners as would be such conduct in a home where one has been kindly treated. The results may be far more serious.

In 1921 there were 32,578 forest fires; in 1924 there were 91,921. Of these, 92 per cent were started by human agencies. Each of them made our country poorer.

The effort to arouse the public to the serious menace of such conditions has already met with encouraging success. Leading periodicals in every section of the country have devoted editorials to the subject. Nature Magazine devoted two pages to cartoons illustrating the subject, and contributed hundreds of reprints which have gone into schoolhouses and libraries everywhere.

The club-women took the matter up with educators whose response was almost uniformly cordial. Thousands of schoolrooms carried the message on their blackboards. The movies and radio helped carry the appeal. Ministers referred to it in their Sunday talks to boys.

There is not space for half the interesting stories that came with the reports. Letters of inquiry came from several points in Canada, from park commissioners and foresters.

In Iowa the superintendent of public instruction has recommended that respect for the beauty of parks and forests and care in guarding against forest fires, be made a part of the training in good citizenship. In all states it should be combined with nature study.

During the coming year the same general plans will be carried forward with redoubled enthusiasm. Club-women and others will cooperate with teachers in impressing upon the school children—for in them, after all, is our hope—what the reckless abuse of our forests may mean. They will show how the forests not only furnish wood but protect the streams in their fulness, shelter wild life, offer opportunities for outdoor recreation and make life a happier thing.

And the children will carry the message home—to some homes whose dwellers would otherwise never hear it.

What store of timber to meet the problem of world supply can be found in the lush forests of the tropics? To seek an answer to this question the United States Forest Service detailed the author of this article. He tells the story here

PHOTOGRAPH U. S. FOREST SERVICE

Lumber, Mr. Gill found, is only one of the products of the tropical tree growth. The leaves of these coconut palms furnish thatch, the fruit is an important food, and the wood is used for building. This article tells of these forests

THE RAIN FORESTS OF THE TROPICS

By Tom Gill

THAT torrential rain had stopped at last, and the tropical sun blazing through torn clouds set all the countryside steaming. Silently we sat our dejected horses, regarding the quivering, dripping landscape. Those rising white wisps of vapor were like innumerable offerings of incense, I thought, sent up in gratitude for the life-giving rainfall. Then, remembering I was in the "rain forests" of Central America, I realized that my simile wasn't so good after all, and that showers were too abundant here to call forth from nature any particular show of gratitude.

As I waited for the cataract at our feet to become a trail again, feeling for all the world as if I were in some gigantic Turkish bath, I fell to thinking of the power of the rain over tree life here in the tropics. And a little of the wonder wrought by the rain came over me. For perhaps no other form of vegetative life is so dramatically responsive to rainfall as are the trees.

Moisture. It is that one factor that sways and changes the kaleidoscopic forms of tree life more than any other—perhaps more than all the others. It is moisture that not only governs the abundance of tree life and the rapidity of tree growth in a forest but actually determines the forest's composition, limiting narrowly the variety of growth in one place and in another admitting a very horde of families and species. And here abundant rainfall has created the distinct type of woodland known to the forester as the rain forests.

To me they are the most interesting and baffling forests in the world. At first sight a confused mass of countless genera and species of giant trees and of lesser growth—lianas twining and swaying festoon-like among the branches, tree ferns, exquisite orchids high up in the leaf canopy, myriads of palms—matchless variety and magnificence. Creeping and menacing things, too, are here—the fig that Indians call *mate palo,* a tree killer clutching some dying forest giant with pitiless hold, and strange vines with restless, tentacle-like rootlets and with long poisonous thorns. And almost every living thing, here, is fighting for root-space in the ground beneath and struggling to reach the sunlight far above.

Something of this drama of survival may have touched the consciousness of Don Ricardo, my guide, as we sat looking across the little valley to the dark forests beyond.

"Men speak of the 'peace of Nature,' " he said slowly, "and always it has seemed to me a foolish saying. For since a child I have ridden these forest trails, and always I see strife between tree and tree, each trying to rob the other of light, trying to brush it aside. And I have seen places in the forest where a great tree has fallen and many smaller trees have sprung up to take its place. And in a few years, yes, very few years, Senor, they are all dead, choked and beaten back. All but one or two." Don Ricardo shrugged. *"Por Dios,* if they call that peace and security. *Que va!"*

Then, trying to light a moist cigarette with a rain-soaked match, he failed lamentably, and called on all the saints to witness his predicament. Meanwhile, the world steamed.

Don Ricardo was right, of course. Here in the rain for-

ests tree associations are dramatically ruthless, each tree holding with dogged tenacity to what advantage it possesses and striving forever to enlarge its patch of sunlight at the expense of its neighbors. Individuals, species, overshadowed in the fight, refuse to yield. Their very forms distorted by the battle, they struggle on, seeking out bizarre adaptations of shape and growth through which they may survive. It is as if even the lowliest plant had drawn from the blazing sun of the Tropics an overwhelming urge for life.

Now, in other forests where temperature, moisture, and soil conditions are less ideal for tree growth this competitive struggle for survival is obscured by other limiting conditions, such as drought and cold. The fight is less marked and less intense. But here Nature has removed all restraints, and given each plant species full freedom to work out its own salvation in the most bitterly intense struggle for survival to be found anywhere in the plant world. "Use all your strength and cunning, your speed of growth and capacity for adaptation," Nature seems to have said, "for here I have given you every needed thing. Only power over your fellows I have not given you—that you must work out for yourselves, or die." It is a battle challenge to a struggle.

HERE IS A GIANT CEIBA TREE

In the rapidity of its growth and the texture of its wood it can best be compared with our own cottonwood tree.

So for most of this forest community life became a race for the sunlight, since sunlight is largely the stuff from which plant tissue is made. And in the race no tree had time to put out side branches, no time to grow in diameter except barely enough to give support. Every effort, every new-born wood-cell, was devoted to height-growth. To spring up quickly and get beyond the shadow of their fellows, that is why the individuals in these crowded forests grew so tall and straight and free from limbs. Many of them developed a capacity for height-growth that is amazing. There are tropical trees that grow from fifteen to twenty feet a year, and once in southern Mexico I was shown a Spanish cedar that had grown thirty-four feet in thirteen months. Yes, even the grasses here have been seized with ambition; for the bamboo, waving its graceful tassled leaves more than one hundred feet above the ground, isn't a tree at all, just grass—grass that for countless centuries has been adapting its mode of life to the competitive pressure about it and little by little raising its head toward the sun.

But for every forest species there is a plane of altitude beyond which growth is impossible. What causes these varying limitations, no one knows. It may be that the ability of each species to raise sap to its branches ceases at a certain height above the ground. And so certain species have not succeeded in specializing in height-growth and, if they are to survive, must specialize in enduring shade. Because some species have learned to live with less sunlight than others require, in the tropical forests are found four, sometimes five, distinct height-layers, or stories, of tree vegetation. In the topmost story of all stand the mahoganies, cedars, and rosewoods—trees well known in the markets of the world. And beneath the lowest strata of tree growth are found the true philosophers of the vegetable kingdom — the mosses, small ferns, and creepers. They have neither won to the sunlight nor suffered extinction. Ready to take what crumbs fall from Nature's table, they live a lowly, contented life in the twilight of the forest floor, at the feet of their struggling companions.

COURTESY TROPICAL PLANT RESEARCH FOUNDATION

THERE IS CONSTANT STRUGGLE FOR SUNLIGHT

The rain forests present the most interesting and baffling phases of tree life, containing many species unknown to science and industry.

Occasional species among those relegated to the lower stories have attained strange adaptations in their search of many cen-

turies for a place in the sun. Some of the palm and cactus species have even forsaken their upright habit to become vines, and now climb and twist toward the sunlight, using as supports the very trees that vanquished them. Other species that elsewhere draw their nourishment from the soil have, through their craving for light, turned themselves into air plants—epiphytes, your botanist calls them—and lead a precarious existence high up in the treetops. To this class some of our most exquisite orchids belong.

The story of these air plants is another dramatic episode in the competitive struggle. They needed the moisture which lay beneath the leaf mold in the gloom of the forest floor, and they needed the sunlight which was far up among the high branches. The gap was too long for a small plant to bridge. Unable to climb like the vines, they eliminated the necessity of climbing by beginning life in the forest canopy itself. Blown by the wind or brought by birds to some lofty horizontal branch or crotch, the seed of the air plant germinates and immediately puts forth long roots. If it is perched very high these roots may never reach the ground—but that doesn't disturb the air plant. For these roots have become highly specialized and possess a spongy outside layer which condenses moisture from the air and adapts it to the plant's need. Some epiphytes, notably some of the orchids, have carried this specialization of the roots a step further and caused them to play the dual rôle of leaf and root. Their true leaves have either disappeared or become useless, like man's vermiform appendix and vestigial eyelid, and the roots have assumed some of the functions and characteristics which ordinarily belong to the leaves.

DEEP IN A TROPICAL RAIN FOREST

In these fastnesses every inch of soil and every ray of sunlight is fought for by the thousands of contending species.

The ways in which species seek advantage over their neighbors are many. In the mangrove swamps competition has developed a special mode of propagation. The mangrove seed, while still attached to the parent tree, produces a stem, often two feet long. When detached it falls to the ground like a plummet and, with the stem sticking straight up in the mud, is ready immediately to put forth roots and leaves. A time-saving device, where time is all-important, for in effect the seed starts to germinate and grow before leaving the tree. Compare this with many of our northern seeds which often lie dormant two years before they burst their jackets and extend a timid and tentative rootlet. Two years! Why, in that time many a tropical seedling grows fifty feet.

Now, in this unceasing struggle in the rain forests many species have failed either to conquer or to compromise. How many thousands of kinds and varieties of plant life have fallen in the struggle and disappeared utterly from the world of living things no one knows. We only know that among the multitude of fossil leaves are represented many species having no living descendant. Probably more species have become debris of the centuries than now exist. We know, for example, that of the genus *Liriodendron,* so widely distributed in North America and Europe during the Cretaceous period, only two species remain.

Here, as in some vast laboratory, one may study the varying character and quality of trees—how some prosper by sheer strength and others persist by stealth and adaptability, how still others endure because they are content to be deprived of all but the bare necessities of life. Here, too, one may observe the delicate balance resulting from the tense interplay of contending forces, and learn how easily it is destroyed by man. One of these forests, in spite of its appearance of solidity and permanence, is something like an elaborately constructed house of cards which man, like a heedless child, often demolishes. Through the centuries the human species in its own fight for existence within the forests has introduced new factors and altered conditions. For these regions, you must remember, are very

old, not only botanically but as a habitation for man, and man has left multitudinous scars throughout the tropical forests in token of his occupancy. Always the tropics have supported the densest populations of the world. Through Yucutan, through Central America and Mexico, that strange, mysteriously obliterated civilization of the Mayas held sway centuries ago, a crowded, intense civilization before which the forests must have melted like snow in the sunlight.

COLLECTING TROPICAL WOOD SAMPLES

In the forest of the tropics there grow many excellent substitutes for our own fast-vanishing hardwood trees.

Even more destructive of the forests are the *flacoleros* of today, those nomadic Indians who destroy a little patch of timber by ax and fire for a corn field only to abandon it a season later. In the course of years they have laid waste immense areas of forest land in making their *conucos,* or clearings. In Latin-America alone are nearly 100,000,000 people who live for the most part on corn and wheat. The areas deforested annually to make room for this transitory agriculture must be enormous.

Yes, it is a common error to believe that these tropical forests are untouched, uninhabited wildernesses. We forget those long pageants of peoples that have gone before, and these tribes whose food depends on the forest clearing. Half the virgin timber of the Philippines is already gone; Haiti is forestless, except for the straggling growths on her higher mountains; the forests of Cuba, exploited for more than 400 years, have degenerated in size and quality till they no more resemble the original cover than a stubble field resembles the tasseled corn.

This does not mean that forests must inevitably perish from the earth, for some countries have already learned to maintain and improve their woodlands through wise use. It only means that not for ever can man reap without sowing — not even in those moist and fertile regions of the rain forests. For Nature in her universal economy keeps very exact accountings and, gladly accepting man as an ally in the task of growing timber, resolutely refuses to be his slave. And as we begin to see more clearly that in the timber of the tropics lies America's one immediate hope in her crisis of hardwood exhaustion, it is well to remember in turn that the hope of these tropical forests is wisdom and forbearance in their use.

As man invades new forest frontiers, he determines consciously or unconsciously whether the timber shall be treated as a crop capable of innumerable harvestings or whether, careless of the aftermath, he shall slash and destroy. Today in the United States man looks upon the results of practically unrestricted forest destruction. He finds little solace in the knowledge that he might have acted with more prudence. Tomorrow, ax in hand, he enters the tropics. It is for him to decide whether he will foster and increase Nature's bounty by a wise harvesting—or whether to add more wreckage to the treeless wastes and worthless jungles of the world.

A Summer Shower Turns Architect

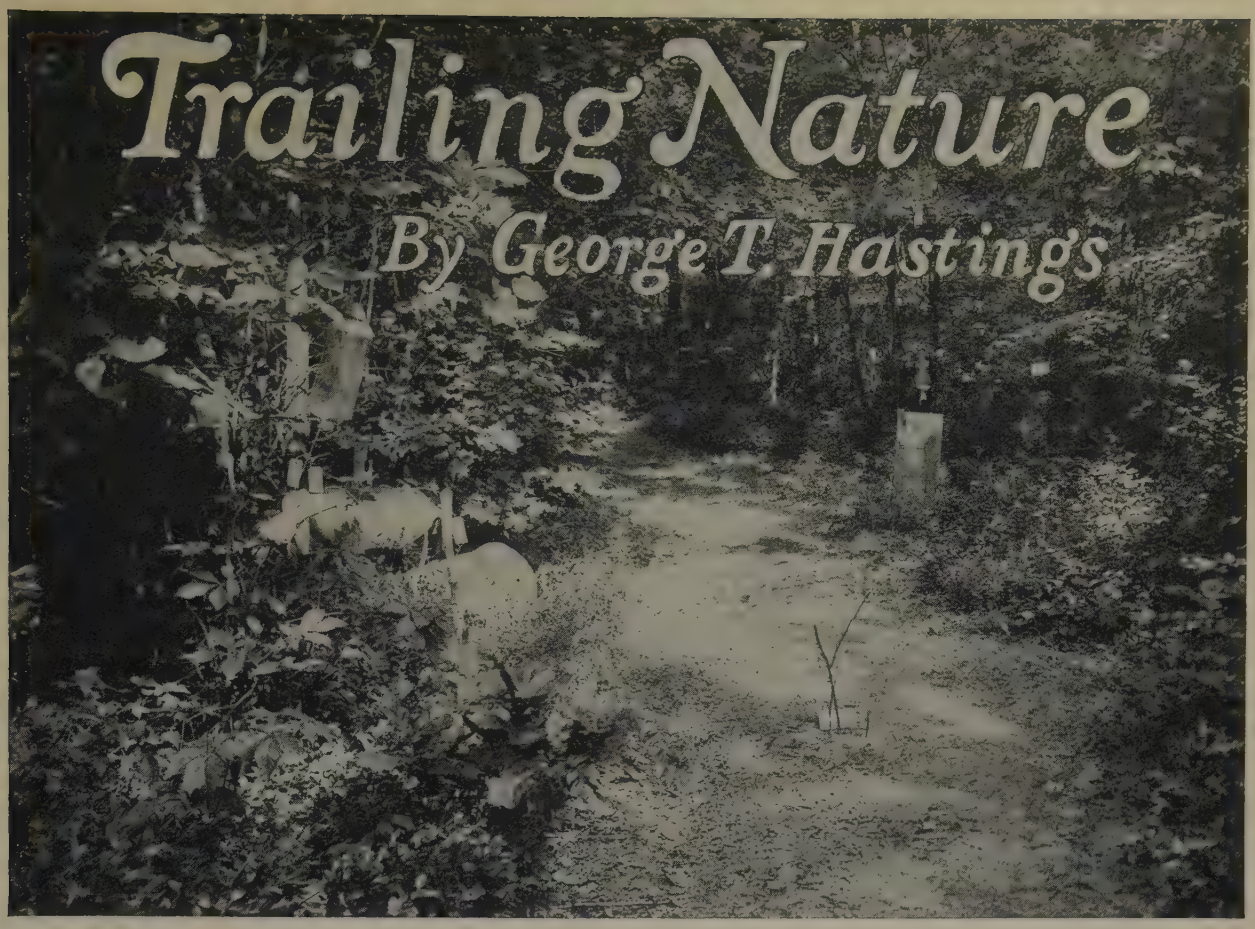
By Ralph E. Williams

THIS is not a picture of the wondrous work of Nature in the soft rocks of one of our western states. It is not the photograph of some glorified ant-hill on the plains of tropical Africa. It is not an airplane view of the Himalayan Mountains with their towering, snow-clad peaks.

It is a photograph of a humble, prosaic sand-pile. A builder left a wagon-load of common sand. Came a heavy summer shower. The tree was high, and there was a distance of about forty feet from the lowest branches to the ground. The well-leaved crown of the tree held back the shower and allowed the water to drip in regular streams from leaf-ends on to the sand-pile below, with the startling fantastic result shown.

THIS IS NOT WHAT YOU'D THINK IT IS

The sun came out shortly after the shower and baked the turreted pile into a mass.



Camper and camp director alike will find much that is suggestive in the accompanying article. It reveals an opportunity open to every one of the hundreds of camps and the hundreds of thousands of campers. It presents another good proof of the statement that the summer camp of today is the greatest extra-educational force that we have.

Mr. Hastings is chairman of the Biology Department of The Evander Childs High School in New York. Last year he served as Nature Study director at the Boy Scout Camps at Kanohwahke Lakes. He found that the work carried on by Dr. Lutz is so remarkably helpful that it is being adapted by various groups in and around New York. There is no reason why it should be limited to that section.

In the photographic heading above we see the Nature trail with its fascinating tags.

THE newspapers called it a zoological garden for bugs, but officially it was the Field Station for the Study of Insects, maintained this last summer by the Department of Entomology of the American Museum of Natural History in one corner of the Harriman Section of the Interstate Park, near Tuxedo, N. Y. The actual work and the planning of the station was done by Dr. Frank Lutz, curator of the department. The station became at once much more than one for insect study; in fact it was an outdoor museum with changing exhibits from day to day. The chief feature was the Training Trail, a half-mile path through the woods, over a little hill, down beside a rippling brook, across on a rustic bridge where the water rested between two riffles, winding along the side of a steep bank, back across the stream, up an old wood road to the starting point.

Along this trail some hundreds of white labels hanging from twigs or tied to sticks set in the ground told the story of plants and insect life. A label on a black cherry tree called attention to a nest of tent caterpillars, just below another label described an egg mass, while a string ran down to a glass case where the caterpillars were at work on a twig of the cherry. Beyond, by a red clover plant, a label gave the information that "Old maids are the support of the British Nation. Old maids keep cats, cats eat field mice, field mice destroy the nests of bumblebees, bumblebees pollinate clover, clover feeds the cattle that furnish the beef that nourishes the Briton." Next where a group of oaks, black, white and chestnut, stood by, the path labels pointed out the differences in the trees.

An American hornbeam bore a description of its characteristic bark, while a little further on a hop hornbeam was contrasted with it. Where red and sugar maples crowded together labels pointed out that, as there is a "U" in sugar, so the leaves of sugar maples have a "U" between the lobes, while the red maples have a "V." The blue berry with its green twigs and the black huckleberry with reddish-brown ones had their characters pointed out. One label confronted the visitor with the demand, "Are you a criminal?" Lower on the same bush a second one explained that criminals break the branches of mountain laurel to enjoy the flowers for a few hours, then throw them away. Low over the trail a twig bore the notice: "Lost—A plant's children (its seeds)!" A string led to a pair of leaves of the pink lady's slipper, while nearby was another pair of leaves with the developing seed pod. Scores of other

trees, shrubs and herbaceous plants were labeled with bits of information, appealing to both interest and imagination. As wild flowers blossomed or faded, new labels appeared. Near a spring that had been cemented around to keep the water clean was a fernery. Originally ten species of ferns grew close together here; eight or nine others were transplanted by Dr. Lutz's daughter, who made the fernery her special care. By the brook, glass jars and plaster of paris cases with glass tops held living insects. In some were larvae of the dragon-flies that could be seen on any sunny day zigzagging above the stream or poising on the tip of some leaf. On an alder twig a label told of the water striders that might be seen on the quiet surface of the pool below, and all summer long the striders remained on the pool.

AN EXHIBIT BY THE SIDE OF THE TRAIL

Here the larvae of water insects are housed in artificial homes near the brook, for the follower of the trail to note and study.

On an oak branch with curious oak apples there was a serial story on five tags, but after following from number one through to number five and learning much of galls and gall insects the visitor found that the story had no end, for nobody knows the reason how or why the galls develop. On some twigs large celluloid cylinders with cloth ends were slipped over branches where caterpillars fed and ends tied. Apparently the imprisoned insects did not mind thus being restricted, for they ate till full growth was attained, then formed their cocoons. Beside the trail glass-sided boxes or frames of wire netting enclosed living insects of various kinds; in one a morning cloak butterfly lived on sugar and water all summer. In the middle of the path a small hole in the ground was fenced around with twigs, one of which told those who cared to humble themselves that, by looking closely, they could see the claw marks of the tiger beetle larva around the sides of the hole. With few exceptions visitors kneeled down to see the scratches made by the "doodle bug" as he hung at the top of the burrow waiting for unwary insects to wander within reach.

A larger notice over the path told of the insect orchestra that might be heard in the trees and bushes. In a covered box, which people were invited to open, were delicate celluloid models of a cricket's wing to show the musical instruments. Though the box was opened and the wings examined by hundreds of those who used the trail, the box was always left covered and the models suffered no injury. In one place a stick pinned down the paper that had wrapped some careless visitor's lunch. The little sermon on the tag bore fruit, for no other litter was dropped along the trail.

Near the end of the trail visitors could turn back along a second and shorter one to test their knowledge. Here the tags bore numbered questions that could be answered by those who had learned the facts on the Training Trail. Many visitors wrote out the answers, then went to Dr. Lutz's cabin to have the papers scored. Occasionally someone made a nearly perfect score, but one of 75 or 80 per cent was above the average.

Parties from camps in the park came daily to follow the trails. As the same camp sometimes sent parties every week, the questions on the testing trail were changed every few days. The idea had such appeal that, before the summer was over, a dozen camps had their own training trails, and the demand for linen tags exhausted the supply in several neighboring towns. The method of learning about Nature had the fascination of a new game, the rules of which were easily learned and everyone could win a prize, a deeper appreciation of the things of outdoors, a greater interest in every future hike and outing.

COURTESY BOY SCOUTS OF AMERICA

A SURE-ENOUGH MUSEUM AT CAMP

Scene inside of one of the houses at the Kanohwahke Boy Scout camps which houses a fine museum of natural history.

Dr. Lutz has written and the American Museum has published an attractive pamphlet on this experiment. It is a document that is distinctly helpful to the camp director and worker. A second edition can now be purchased for ten cents from American Museum of Natural History, New York.

Some Interesting Things to See in May

By E. Laurence Palmer

I ONCE HAD an old fisherman friend who used to express his exuberance in the following manner, "I feel like I'd like to git out and git." Many of us may feel this in May if we don't feel it at any other time in the year. The question is if we are to "git out and git" what will we find when we "git" there. Possibly this section may be of assistance to any who have this feeling and since there are so many types of places to which we might like to "git" I am going to suggest things which might be of interest in as many different kinds of places as possible.

Some readers may like to steer their course towards the golf links; some, to the garden patch back of the house. Some may prefer a trout brook and others, the wide open meadows. Still others may for one reason or another find it best or necessary to stay right at home. Whichever may be your lot May will offer you something of interest I am sure.

The green on the golf-links or on the front lawn may be green for a number of reasons. Not infrequently it is due to clover. If so here's something for you to notice. Clover isn't always just clover. There are a large number of kinds and some of them look somewhat alike. The best clover for lawns and greens is probably the white clover. This does not mean that all clovers with whitish flowers are white clover because alsike clover also has whitish flowers. Each of these clovers may serve a useful purpose in its place. Alsike does not root at the joints as does the white clover and it produces rose-tinted flowers which many people call white clover and use for ornament on the table later in the season. Some time when you are hunting for a golf-ball near the green or in the rough see if you can't find specimens of both of these kinds of clovers. If you were raising forage for your pet horse or rabbit, which of the two would you prefer?

Possibly the golf ball or something else led you to wander off into a bit of woodland instead of into the more open country. If so don't be discouraged. There are interesting things to look for there in May also. In all probability the big northern migration of birds will be at its height. Many of the small warblers, some that have wintered in South America, will be hurrying through our country this month to their nesting sites in the north. Some of them may be brilliantly colored and others may be more somber. You may have noticed some of the brilliantly colored ones in the museum during the winter and wonder why you don't see all of them easily when they are in the trees so abundantly. Remember, a bird in a museum surrounded by a white case or with a plain background is quite different from a bird in a tree. The bird in the tree is colored not only by its feathers but by the light reflected from the young leaves of the trees. If you don't believe that this makes a difference, take a stuffed bird and place it over a white piece of paper and place a similar bird in a natural position among but not hidden by green leaves and walk off and see which one remains conspicuous the longer. Another interesting experiment you might try in this connection is to place two stuffed birds side by side out of doors, one being right side up and the other bottom side up and walk away and see which one remains conspicuous the longer. See if you can explain what happens and translate it into an appreciation of why you do not see so many of the migrating birds that fill the air of the forests with their songs in May.

A bit of waste land between some old buildings may be the only bit of country where you can study wild life in May. It is undoubtedly full of interesting things. Turn over some old board in such a bit of land and you may find some little gray sow bugs or their close relatives the pill bugs that promptly roll up into balls like armadillos. Comparatively little seems to be known about the life history of these creatures. It is known that the female sow bug carries her eggs in a pouch and that the young are much like the adults in shape, form and habits. See if you can't find something more about them for yourself. The creatures eat decaying plant material and are harmless so you do not need a great deal of bravery to handle them and study them first hand. It may be difficult for you to see this for yourself, but the second pair of structures under the tail of the male sow bug are pointed and are not so in the female. Can you make this out in the specimens you find?

You may be fortunate enough to have a garden plot in which you may do a little digging in May. Possibly you may not harvest any of the crops that you plant but eating garden truck isn't all the satisfaction there is to be gotten from a garden. When you are turning over a bit of soil you may turn up a white grub. This may be the grub of the June beetle that may at some later time bump his head foolishly into your window pane at night. It won't take you many weeks to find out for yourself whether these white grubs that you find in the garden in May turn into "June bugs" by the next month. A spade full of dirt with some potato parings and a few grubs put away in a screen-covered pail should furnish you the keys to answering this puzzle.

I shall not deprive you of the pleasure of finding this out for yourself, so go to it.

Possibly you would prefer to put the white grub on a trout hook and dare him to take a bath before some hungry trout. If such is the case, you feel as I do. If you try this and the first trout that you catch with the grub happens to be under the legal size don't forget to wet your hands before taking him off the hook and letting him go free. Dry hands often remove the protective slime on trout and permit the successful attack of some of the fungi which frequently kill them. If you find a dead fish in the water you may see some of the fuzzy patches produced by the fungus *Saprolengnia.* Put a bit of this "fuzz" in a bottle of water and in this bottle put a piece of meat. In another bottle put a similar piece of meat in boiled water. Leave the two bottles for a few days and see what happens to the meat in each. Draw your own conclusions.

While you are sitting on a rock waiting for the trout to bite you may notice some green felt-like lichens that seem to grow on the bare rock. These lichens are really a combination of two kinds of plants, an alga that gives the plant its greenness and supplies it with starchy foods and a fungus which assists in keeping the alga in a favorable position and supplied with water. Manna is supposed to have been a lichen. At least, there is a lichen which could very satisfactorily have filled the rôle played by manna. If you think you could thrive on lichens try one for yourself. It might interest you in this connection to know that reindeer moss is a lichen and as it is a staple food for reindeer these lichens are much more important than the one on the rock beside you may seem to be. After you have removed the lichen see if it has left any record on the rock on which it grew. How about it?

Speaking of lichens reminds me of a place where I used to go to look for them in Iowa. It was an old waste place where the plants seemed somewhat unusual because the soil was very sour. Mosses and sour-grass abounded there. You will undoubtedly find many mosses that will prove interesting in May. Some of them will have performed a very important function of their lives and will be producing their spores. See if you can find out how some of the mosses which you may find spread their spores in gentle May.

Swamps may be interesting in many ways in May. For example when you get out near where the reeds and open water meet you may see some black whirligig beetles whirling crazily round on the surface of the water. These creatures have four eyes unlike other beetles. See if you can find these eyes and offer suggestion for their presence. You may not be right in your final conclusion but the beetles will keep you interested anyway. Possibly if you examine one to see how its legs are put on you may come to a correct conclusion as to why it can "whirligig" so successfully. Why is it?

The meadows back of the swamp may begin to come into their own in this month of May. If so you will enjoy watching a few of the grasses that grow there. Some early morning you may find them covered with what you call dew. You should not be certain that this is so because many plants give off what botanists call "water of guttation" which is not dew at all but water that has come up through the plant. Put a quantity of this water on a clear glass and a similar quantity of what yon know is dew because you find it elsewhere than on a plant, on iron, for example, and see if there is any difference between what is left by the two when the water dries up. How about this? Can you explain it?

My list of ten interesting things is almost gone so we will hurry back home and see if we can't find something interesting there. In the garret or in the cellar you may find some of the egg cases of a house spider. One or two of these may prove interesting if you cut them open in May or you may adopt a pet spider for your own and find out how long it takes for one of these egg cases to produce results from the time it is first formed. Not many people have watched a spider build one of these egg cases, though some have watched it carefully. See if you can't be one of the lucky ones.

A glance forward to those rare days in June and NATURE MAGAZINE for the coming month. Ben Hur Lampman contributes an article that makes one wish to lock the desk and away to the out-of-doors. Gayle Pickwell instructs us as to what those June clouds mean. C. W. Gilmore rustles some fascinating pages of the past in an article on animals long gone. There are articles by Albert Payson Terhune, William L. and Irene Finley, Albert A. Hansen, Ben East and others. It's a real June issue.

PHOTOGRAPH WILLIAM L. FINLEY AND H. T. BOHLMAN

JOHN SMITH has a home. He is a citizen of the state where he lives and enjoys the protection of its laws and its government. The same state which protects John Smith probably protects, at least to a certain degree, the wild animals and birds, which are likewise citizens of the state even if they cannot vote. But many birds are migratory—they have no respect for state lines, and even international boundaries set by man do not trouble a whit the instinct which guided the great spring and fall migrations for countless generations before such things as human nations took form in America. The same Canada goose honks his way across a dozen states and becomes subject to a dozen different varieties of protection or lack thereof. A few years ago some states allowed spring or fall shooting and some both.

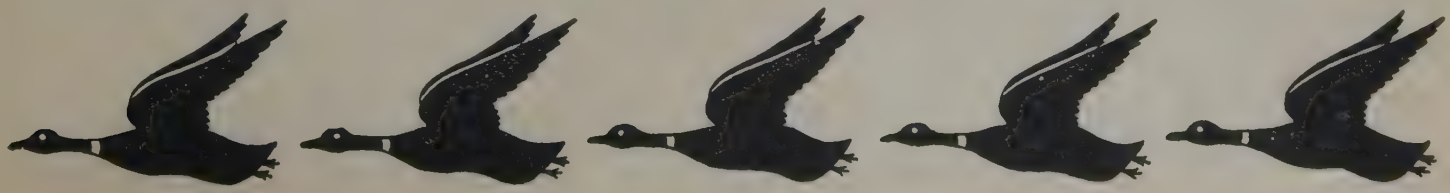
Then it was that men and women interested in wild life protection took up the battle. They maintained that just as it was necessary for Interstate Commerce to be regulated by the Federal Government so the Federal Government alone could solve the difficulty in regard to winged migrants. Congress passed a law assuming supervising authority for the protection of migratory wild fowl, and finally a treaty was concluded between the United States and Great Britain whereby both Canada and the United States agreed upon uniform regulations.

Still it has been a difficult problem to keep many of our migratory game birds from growing less and less in number. The increase of hunters throughout the land, the improvement of firearms, the disregard for game laws and the lack of adequate warden service in enforcing them, have been mainly instrumental in lessening the number of birds. These causes, however, have been supplemented by other reasons why ducks, geese and wading birds have grown less in number. In order to exist and increase birds must have places to nest and rear their young. They must have resting and feeding places along their routes of migration. Ducks will increase rapidly if their ancestral breeding places on inland ponds, lakes and swamps, especially through the northern part of our country, are protected. A very large number of lakes and ponds have been drained and many swamps have been dried up under the guise of making agricultural land. With the gradual spread of population, each year the migratory flocks return to former nesting sites, only to find them destroyed, and their natural food supply diminished.

The vital point today in wild fowl preservation is that a goodly number of the remaining lakes, ponds and swamps must be preserved. No matter how many game laws we have or how rigidly these are enforced, birds like people cannot live without homes, and many species are sure to be pushed to the point of final disappearance.

How can these necessary marsh areas be protected and preserved for the birds? Individual states and groups of private individuals cannot handle the problem. It is too big. Then, too, only a few of the states along the chief migration routes would have to handle all the burden, while practically all the other states would equally gain. The Federal Government has been indicated by no less an authority than the Supreme Court of the United States as the agency responsible for migratory wild fowl. The Federal Government must act by purchasing numerous large areas of marsh land just as it is purchasing other land to protect forests.

A little over a year ago a bill to authorize and provide funds for marshland purchase passed the House of Representatives and just failed of enactment by the Senate, because of the last minute legislative jam. Under the title of the "Migratory Bird Refuge and Marshland Conservation Act" it is now once more before Congress with the united support of the Audubon Societies, the Isaak Walton League, and fish and game commissioners from the north, south, east and west. If this law is passed it will provide an adequate fund for purchasing a chain of ponds, lakes and swamps, particularly along migration routes. It will not only furnish refuges for the wild birds, but will supply homes for certain food fishes and fur-bearing animals which are of economic value to the American public. In the wide extent of our country, it is right that certain wild spots be preserved for the benefit of the children of future generations of America.

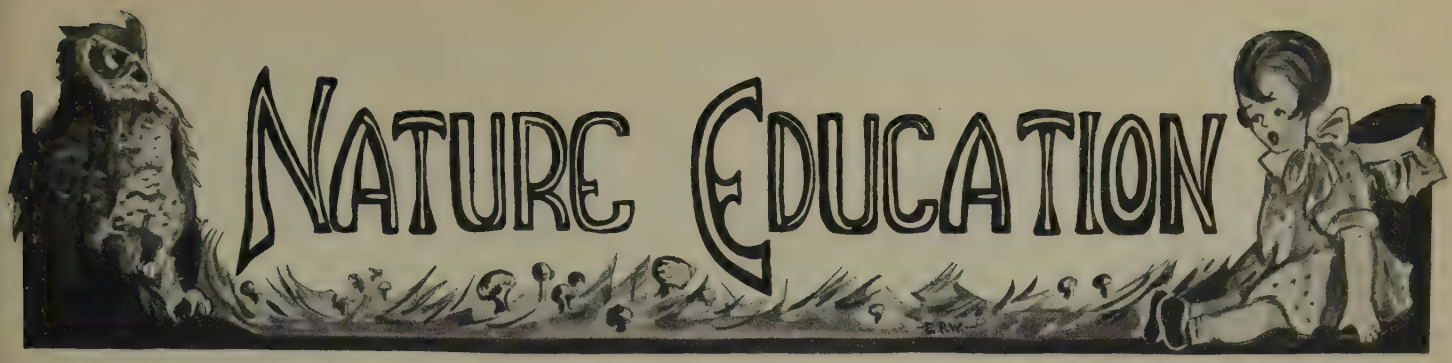


Life Histories of Some Common Birds

The birds listed below are of sufficiently general distribution so that most of them will be found at any place in the United States and Southern Canada. Some that have a more limited distribution have close relatives that extend into adjacent territory.

The bird life histories would prove particularly interesting to geography teachers this month, since many of our migratory arrivals are completing a journey which started in South America. Interesting geography problems may be gotten around birds as the killdeer, and the barn swallow, whose winter range is shown below.

Common name Scientific name	English Sparrow Passer domesticus Linn.	Crow Corvus brachyrhynchos Brehm	Barn Swallow Hirundo erythrogaster Bodd.	Mallard Duck Anas platyrhynchos L.	Killdeer Oxyechus vociferus L.	Northern Flicker Colaptes auratus luteus Bangs
Where seen	Around barns, streets, houses and in fall in grain fields	Woodlands and farm lands at almost any time of year	Flying about barns and waterways	On lakes and streams	Meadows, fields and near water	On dead trees, poles and on ground
Distinctive appearance	About six inches long; male brown above, chestnut on wings, gray beneath and with black "bib"; female much duller, without black bib, looks dirtier	Nearly twenty inches long; black being more dull late in season before moulting; inner toes rather close together	About seven inches long; forked tail, long slender wings; steel blue above and chestnut brown beneath except in female; large mouth though not obvious; feet small and used but little	Nearly two feet long; long neck, webbed feet; rich purple patch on wings bordered at base and tip by black and white	Slender-winged, brown, 10½ inches long, with orange on rump and two black rings on neck and throat	Brown birds with long bills and distinctive white rumps which show conspicuously in flight; black crescent on breast; only brown woodpecker in range; 12 inches long
Distinctive habits	Noisy, quarrelsome, domineering disposition and fondness for man's company	Wariness, noisiness and habit of working together in flocks for a common end	Graceful swooping flight, rather interesting about nesting sites	Fly with short wing strokes and with neck extended; show white bars on wings	Active and noisy or perfectly still; wonderful flier challenging our admiration	Usually on tree trunks head up; often on ground near ant's nest
Song	Chirp, chirp, chirrup, chirrup	A variety of caws, gurgles and other typical noises	Weak but pleasant twitter	Loud quack from female; a lower call from male	A whistled plaintive two or three-note "kill-dee"	A variety of calls including commonly "wake-up; wake-up"
Courtship	Male hops about with outspread tail, drooping wings constantly calling	Male pursues female	Twitter continuously, droop wings, spread tail and ruffle feathers	Male pursues female flying irregularly high in air; various antics in water		Male bows, hops, spreads wings and calls
Migration seasons	Too common permanent resident	Common permanent resident	In summer range generally from about April to September	Winter range about September to March or thereabouts	April to October in summer range	March to October in summer range
Summer range	Europe, Asia, Australia, New Zealand, America and elsewhere	Southern Canada on through southern United States except in Florida	Northwest Alaska to south of Hudson Bay and south to northern Mexico and North Carolina	Southern British Columbia and Keewatin to southern California and Wisconsin.	Central British Columbia and Quebec to Gulf of Mexico and central Mexico	Northern and central North America
Winter range	Same as above	United States	Southern Mexico to northern Argentina and central Chile	British Columbia and Newfoundland to Lower California and Florida	California and New Jersey and south to Venezuela and Peru	Southern United States
Nest	Any material available built on buildings or in trees	Sticks, bark, hay and the like, generally high in trees	Mud and straws; lined with feathers; high in barns or buildings	Lined with down; on ground	A mere collection of grass, sticks and leaves on the ground	A hole in a dead tree or stump, chip-lined
Eggs	White to brown or white with olive brown markings; 4 to 7; .8 by .6 inches	Bluish-green with brown markings but variable; 4 to 6; 1.6 by 1.2 inches	Cream white with brown spots; 3 to 5; .8 by .55 inches	Pale buff; 8 to 12; 2 by 1.5 inches	Buff-white with chocolate markings and spots; 4; 1.5 by 1 inch	White; 5 to 9; 1 by .85 inch
Incubation	12 to 14 days	About 18 days	11 to 13 days	26 to 28 days	26 to 28 days	11 to 16 days
Nature of young	Blind, naked, helpless when hatched	Blind, naked, helpless when hatched	Blind, naked and helpless when hatched	Down-covered; able to swim and feed soon after hatching	Down-covered when hatched; leaves nest soon	Blind, naked and helpless when hatched
Number of broods	Three	One	One	One	One	One
Food of young	More insects than are eaten by adults	Almost any organic matter; insects, birds, etc.	Insects	Water life	Mostly insects	Largely insects; many ants
Food of adult	Seeds, flesh, insects, refuse and other things	Almost anything; carrion, insects, birds, small mammals, grain, fruit	Exclusively insects caught on the wing	Water plants and animals	Many kinds of insects	Insects dug from wood, bark and earth, particularly from ant hills
Sex differences	Male with black throat-mark as above	Male and female alike	Female usually lighter beneath	Male with green head and white collar; female, without	Male and female similarly colored	Male with black mustache
Seasonal variations	Males brighter in the spring	Little seasonal change except for lustre of new moult	No seasonal change	Males like females from June to October	Little seasonal change	Brighter in the spring and summer
Age variations	Young of both sexes much like the adult females	Young similar to adults	Tails shorter in younger birds	Young like females	Young duller in color than adults	Young similar to adult but with more red on head
Relation to man's interests	Defaces buildings, destroys grain and refuse, drives desirable forms away	Does much good and considerable harm; may be good or bad, certainly of some use	Devours many noxious insects particularly mosquitoes	Valuable and interesting game birds	Useful as insect destroyers; interesting; protected by law	Useful destroyer of insects
Use to nature	Natural street sweeper; not desirable though only bird that can be seen by many city people	Controls multiplication of birds, insects, small mammals; scavenger; interesting	Most valuable of destroyers of flying insects	Valuable for food, for sport and for observation	Food for flesh eaters; destroyer of insects and small animal life	Controls multiplication of wood-boring insects and ants



PROF. E. LAURENCE PALMER, CORNELL UNIVERSITY, DIRECTOR

ASSOCIATES

Prof. George R. Green, President, American Nature Study Society.

Prof. J. A. Hollinger, President, National Council of Supervisors of Nature Study and Gardening.

Mrs. Elizabeth K. Peeples, In Charge of Nature Study, Washington, D. C., Schools.

Prof. L. D. Wooster, Kansas State Teachers College.

Miss Clelia Paroni, Supervisor of Nature Study, Berkeley, Calif.

Dr. Bertha Chapman Cady, Girl Scouts of America.

What Is Nature Study Nature Study, so far as the pupil is concerned, says Prof. L. D. Wooster, is just his natural interest in and study of nature. There are a "thousand and one" things about him every day which he wants to know. That's part of the instinct of the thing. He does not know why he wants to know; he just wants to know, and that is reason enough.

Nature Study, so far as the teacher is concerned, is sympathetic watching for these natural interests of children and encouraging them; it is calling attention to a new bird, or an eclipse of the moon about to occur, or a snowflake, or a flower, or a fossil; it is asking a question which requires observation for answer; in other words, it is keeping the thing in mind and watching for opportunities, but letting the children apparently initiate as much of it as possible.

* * *

Nature Magazine as Prize For the best Nature diary kept by students in the eighth grade of her school Miss Irene Wolkensdorfer, of Herndon, Kansas, has offered a year's subscription to NATURE MAGAZINE. The Nature diary serves as a good habit-former in observation and interpretation of Nature. The children in the above-mentioned eighth grade will always be better and more intelligent observers, and will always enjoy the great out-of-doors more because their teacher started them on Nature diaries.

* * *

A Step in Cooperation Realizing the need for a program that would coordinate the Nature activities of national groups working with young people, Dr. George H. Sherwood, Director of the American Museum of Natural History, issued an invitation to the following groups for a meeting on March 28, 1925, at the Museum: American Museum of Natural History, Boy Scouts of America, Campfire Girls, Inc., National Board of Y. W. C. A., Pioneer Youth of America, Woodcraft League of America, Camp Director's Association, Mr. Fay Welch, Member at Large. Among the aims stated by this cooperating group, to be known as the Coordinating Council on Nature Activities, are the coordination of the Nature activities of the various organizations having a Nature study program on conservation of wild life and natural resources; and the encouragement of public schools and other educational institutions to include courses of nature study and conservation in their curricula.

* * *

D. C. Schools Study Forestry Dr. Frank W. Ballou, Superintendent of Schools, Washington, D. C., has accepted three thousand copies of the Forestry Primer, published by the American Tree Association, which are being used as textbooks by eighth grade classes in preparation for the observance of American Forestry Week.

* * *

A Florida Nature Cabin Nature Cabin, the home of the Eustis Junior Naturalists in Eustis, Florida, was dedicated January 18, 1926. The organization, made up of twenty-one boys and girls, was formed for the study of nature. The emblem of the society is the palm tree; the colors, brown and green; and the motto, "Nature our teacher."

* * *

Nature Clubs Organized Two Nature clubs are a feature of the science activities of the Okmulgee, Oklahoma, high school science department. The John Burroughs Club is made up of upper class boys, and the Field and Stream Club, of boys and girls of the seventh and eighth grades. The programs consist of field trips, talks, demonstrations, and work periods during which each student follows his own interests. There is a point system by which the club members can win honors in their club work.

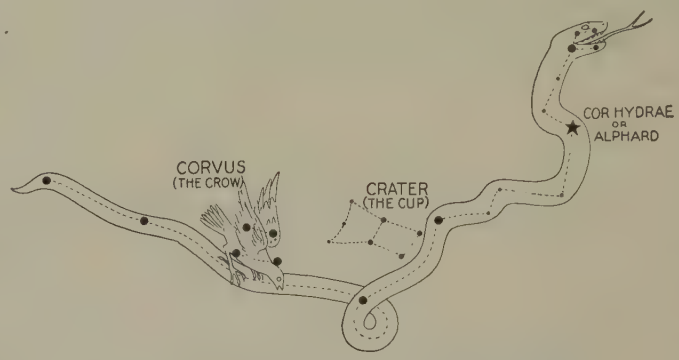
* * *

Wildflower Preservation Play The need of wildflower preservation returns with the spring, and a play is often one of the most effective ways of bringing the subject to the attention both of children and adults. "Everybody's Affair" by Oleda Schrottky, a Girl Scout play on the subject, can be ordered from Girl Scout Headquarters, 670 Lexington Ave., New York City, at a cost of fifteen cents a copy. The play has been put on for less than ten dollars for the entire production, including costumes necessary to put on a good performance.

HYDRA—A CELESTIAL REPTILE

By Isabel M. Lewis

SNAKES and dragons are well represented among the fanciful forms of birds and beasts which men have pictured among the stars. In the northern sky is Draco, The Dragon, its tail lying midway between the two Bears, Ursa Major and Ursa Minor, and its head beneath the foot of Hercules. In the southern hemisphere, far below our horizon, is Hydrus, The Serpent. In the eastern sky at this time may be seen Serpens, which Ophiuchus, The Serpentbearer, holds in his hands. Largest and most important of all these celestial reptiles, however, is Hydra, The Water-snake, which, with its two riders, Corvus, The Crow, and Crater, The Cup, fills all of the southern sky at this time below both of the constellations of Cancer, Leo and Virgo.



Hydra—the Water-Snake with its Riders, Corvus and Crater

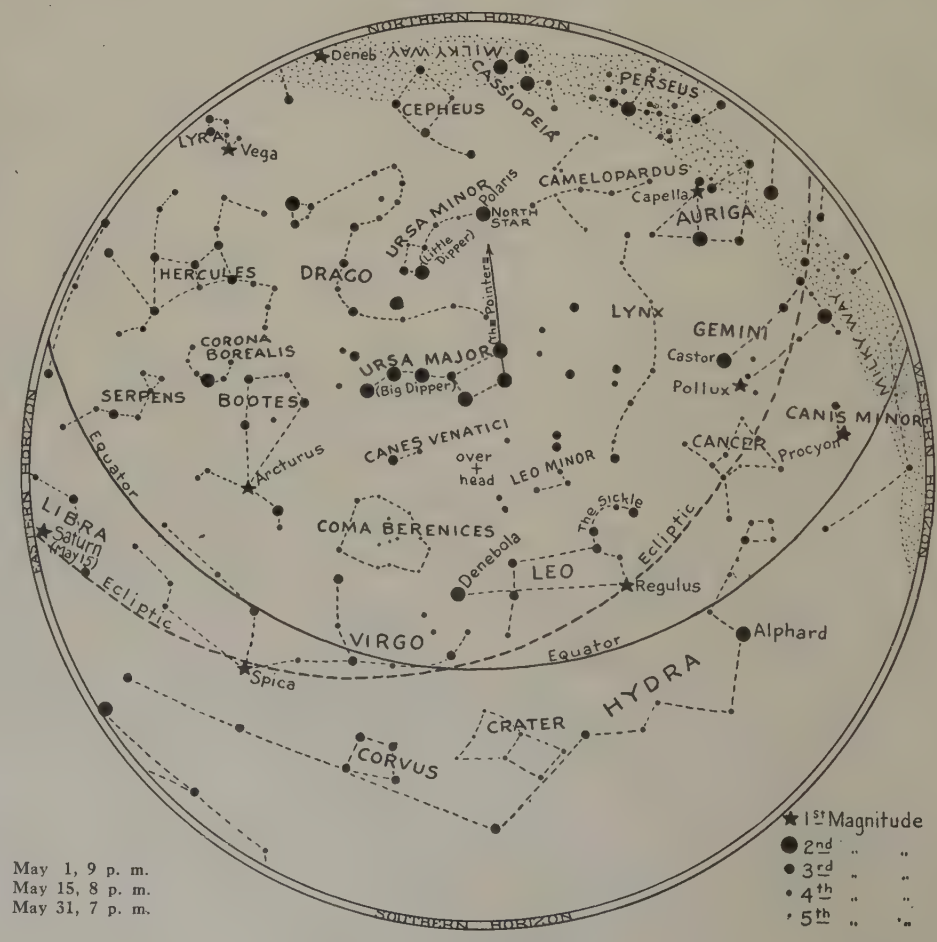
According to one ancient legend the god Apollo had for a messenger a crow which he one day sent with a cup for water. Spying a fig tree with its fruit nearly ripened the crow was tempted to linger to await the ripening of the fruit. Returning finally to Apollo with a water-snake in his mouth he gave as an excuse for his tardiness that he had been attacked by the snake. Apollo in his wrath at the falsehood transferred bird, snake and cup to the heavens, where the crow, tantalized with thirst, seeks vainly to drink from the cup. It was from this legend that Corvus was sometimes known as The Fig Bird.

A later story has it that Corvus represents Noah's Raven, and that in its failure to find dry land at the time of the Deluge it alighted on the back of the water-snake. Others who pictured Biblical forms in the sky in early ages saw in stars of Corvus and Crater nearby The Ark of the Covenant.

Though Hydra covers a great part of the sky, it contains no exceptionally bright stars. Its brightest star is only of the second magnitude and is known by the Arabic name of Alphard, which means The Solitary One, a very appropriate name as there is no other bright star near it. In the sixteenth century the famous Danish astronomer, Tycho Brahe, gave it the name of Cor Hydrae, The Serpent's Heart, a name that is still used frequently.

Crater, The Cup, lies due south of Denebola, the star at the tip of Leo's tail, and is made up of faint stars only. Corvus, next to Crater on the east, is very easily recognized by the compact little four-sided figure that is outlined by its four bright stars of the third magnitude. The beautiful first magnitude star, Spica, in Virgo, which represents the sheaf of wheat held in the maiden's hand, is not far distant from Corvus on the northeast.

Procyon, The Little Dog-Star, still lingers low in the west in the May skies, though his illustrious companion, the sparkling Sirius, The Dog-Star, has long since departed. Castor and Pollux, The Twins, also remain in view in the western sky throughout the month, while the golden-hued Capella, sinking low in the northwest, vies in brilliancy with the diamond-like Vega now rising in the northeast. These two stars on opposite sides of the north pole of the heavens, and at nearly equal distances from it, remain together above the horizon but for a short time, one disappearing soon after the appearance of the other. Vega, Capella and Arcturus in Boötes, which is now high in the eastern sky, are the



To use hold over the head with top toward the North.

three brightest stars in the northern hemisphere of the heavens. Arcturus and Capella are estimated to be almost exactly equal in brightness while Vega is but a shade brighter than the other two stars. All three stars are also our near neighbors among the stars. Capella, the most distant of the three, is about fifty light years, or about three hundred trillion miles, from the earth, while Arcturus is approximately thirty and Vega twenty-five light years from the earth. Arcturus can easily be located by prolonging the handle of the Big Dipper toward the southeast for a distance about equal to the extent of the Dipper. At this time of the evening and year the Big Dipper will be found on the meridian due north of the zenith and high above the north pole.

The planet Saturn has now come into the evening sky and will be in opposition to the sun on May 14. It will then rise at sunset and be above the horizon until sunrise. It is now equal to Capella in brightness and will be found in the constellation of Libra, some distance to the east of Spica, in Virgo, in the southeast in the early evening. This is an excellent time to view the planet and its rings.

Venus, Mars and Jupiter are still to be found in the eastern sky before sunrise. Jupiter, now the farthest west of the three planets, will be on the meridian due south at sunrise on May 17, when it is at quadrature or ninety degrees from the sun. In mid-latitudes it will then rise about three and a half hours before the sun.

Next to Venus it is now the brightest object in the heavens. Venus is still a magnificent Morning Star, though it is decreasing somewhat in brightness as it recedes from the earth. On the 4th of May the planets Venus and Uranus will be in conjunction. Uranus will then be due north of Venus and distant from it less than the angular extent of the full moon. As Uranus is rated equal to a star of the sixth magnitude in brightness, it is just at the limit of visibility to the naked eye. This will be an excellent time for possessors of small telescopes or strong field glasses to look for this distant planet, which is now over 1,930,000,000 miles from the earth.

Mars will be found in the southeast in Aquarius this month, to the west of Venus and east of Jupiter. Though far less brilliant than either Venus or Jupiter, it is now brighter than some of the stars of first magnitude and is steadily increasing in brightness as it approaches the earth. It may be easily identified by its deep reddish color.

FINLEYS TO LEAVE FOR THE NORTH

Just beneath the Arctic Circle, a mere speck on the map 'twixt Alaska and Siberia, lie the Pribilof Islands. Great colonies of sea birds make their homes there amid forbidding rocks. Foxes rear their young in fields that flower luxuriantly with blue lupines and Arctic poppies. Great rookeries of fur seals set fin only on these volcanic islands of the Bering Sea, living as in centuries before the advent of man.

It is only natural that such a magnet as this would draw William L. and Irene Finley to the northland fastnesses. In May they will be on their way there—another American Nature Association expedition armed with cameras and film, typewriters and eagerness. The expedition is sailing from Unalaska on the Westward *under the direction of Mr. Campbell Church of Oregon. The Bureau of Fisheries of the United States Department of Commerce is cooperating with the American Nature Association in arranging the expedition.*

THE EXPEDITION BOAT *WESTWARD*

From the Pribilofs the party will turn southward to the Aleutian chain of islands, there seeking game for the camera in the inland. From these mines of wild life, the Association's party will bring back stories in words and in film, pictures and material for NATURE MAGAZINE. *All who know the work of the Finleys know what this will mean in the way of entertainment.*

SOWRITE

Real proof of SOWRITE'S practical qualities is found in the enthusiastic testimonial by Mr. Olsson, Foreman of the New York Parks Department.

With SOWRITE you, too, can sow seeds like an expert gardener! Adjust SOWRITE'S metal slide to size of seed, fill up bowl and tap lightly with your finger. **Seeds scatter at correctly spaced intervals!** Seedlings spring up separately. "Thinning out" becomes unnecessary; more plants are produced per package of seeds. Pays for itself in stronger, healthier plants and vegetables.

Mr. Olsson, in one of the New York City Greenhouses sowing seeds with SOWRITE.

"It scatters seeds evenly" —says C. C. OLSSON

Foreman Gardener
N. Y. City Dept. of Parks

At a touch SOWRITE distributes seeds *separately* and *evenly!*

SOWRITE Model "A" For sowing all fine seeds. Made of tough fibreloid. Metal slide regulates flow. **Use the Coupon.** **$1.00** postpaid

SOWRITE Model "B" For sowing all large seeds up to sweet pea size. Metal construction, with adjustable slide. **Use the Coupon.** **$1.50** postpaid

$1.00 [MODEL-A] *Postpaid*

Clip and mail

"SEERITE"

A Permanent Garden Label That *Can't* Wash Off!

Your garden label is enclosed in "Seerite's" sturdy, clear glass cylinder, and tightly sealed with the cork-tipped wooden peg. In spite of watering can or rainstorms it stays readable always! A box of 8 "Seerites" for $1.00 postpaid. Use the coupon!

8 FOR **$1.00** postpaid

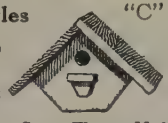
"BUILT-EASY" BIRD HOUSES

For Beauty and Protection

Attract lovely song birds to your garden season after season. They'll pay their way by destroying thousands of bugs, mosquitos and boring pests!

"A"

Three Styles **$1.65** each *Postpaid*



"C"

All 3 **$4.50** *Postpaid*

"B"

Model "A" and Model "C" for Jenny Wrens. Model "B" for Bluebirds, Martins or Woodpeckers

MAX SCHLING, Inc., 785 Fifth Avenue, New York City.

I enclose (check)—(money order)—(cash) for
"SOWRITE" seed sower—Model "A" ($1.00).....Model "B" ($1.50).....
"SEERITE" marker ($1.00 for 8—$11.00 per 100).....
BIRD HOUSES—Model "A"....Model "B"....Model "C"....($1.65 each—all 3 for $4.50)
Above prices include all mailing costs

Name .....

Street..... City..... State.....
(N) (Please print plainly)

Chicken-hearted

By ALEXANDRE HOGUE

OUR PARTY of four had made camp on a mesquite covered hill, a few hundred yards from the great pecan groves along the South Concho River, twelve miles south of San Angelo, Texas. We had rolled out our beds and were preparing the evening meal when one of the men called attention to the boldness of a killdeer. In Texas the killdeer is so plentiful that it may scream frantically without being noticed, but if it comes up as near as seven or eight feet to scold, it becomes decidedly noticeable. So we began to observe.

The neat little creature charged at us, scolding insanely, ran away a few paces, returned to scold and again ran away, this time with a plaintive cry of distress, hobbling and drooping her wing as if it were broken. She was using the favorite trick of the dove to lead us away—but why? We examined the ground carefully but found nothing except rocks, twigs and curly mesquite grass. Not a sign of eggs or babes, so we resumed our camp routine. Silently she stood observing us; silently, until someone moved in her direction—then the fluttering limp and cry of distress were skillfully and plaintively re-acted.

Curiosity killed our camp life, so we decided to retire quietly to a short distance and await developments. No sooner were we away than the alert little lady hurried up to within four feet of our fire and settled snugly down with a contented "chuckle" and then said no more. We had walked all around and over her nest without doing any damage but were always looking too far out to find it. Four buff colored eggs, splotched with dark brown were reposing on a bit of sand between several stones and tufts of grass. Perfect protective coloration! Hardly visible even after they were found!

THE KILLDEER ITSELF

Tying a string to the shutter we set our camera up facing the nest and retired again, and again Mrs. Killdeer's bitter scolding ceased as she settled down on the eggs in a perfect pose. After pulling the string we broke camp just to move away far enough to ease her anxiety and to save the eggs from becoming chilled for lack of her warm breast.

I have known unthoughtful men who would have robbed the nest and remained to camp right there. But a thoughtful man, if he loves children, has a tender spot in his heart for the young of all creatures—whether clothed in scales, feathers or fur—and if he loves his mother, any species of mother in distress will enlist his sympathy. Outspoken and unashamed, all four of us are proud to admit that we are "chicken-hearted." And why not?

Schenley Gardens

announces a series of unusual offerings in tulips to introduce a new service for planting beautiful gardens at moderate cost.

Our Show Collection

Five named varieties selected for their gorgeous colorings:

1. Darwin—King Harold (Rich red)
2. Breeder—Gloria (Lavender)
3. Darwin—Beethoven (Rose pink)
4. Cottage—Mrs. Moon (Golden yellow)
5. Cottage—Orange King (Orange with golden shadings)

5 each of these 5 varieties, 25 bulbs $1.50

10 each (50 bulbs) $3.00 *or* 20 each (100 bulbs) $6.00

Special Color Selection Offer

Especially suitable for borders. Giant May-flowering tulips—see colors below.

25 Bulbs 5 each of any 5 colors listed below $1.00

10 each of any 5 colors (50 bulbs) $2.00 20 each of any 5 colors (100 bulbs) $4.00

CRIMSON	YELLOW	LIGHT PINK	LILAC
SCARLET	DEEP PINK	BRONZE	WHITE
VERMILION	SALMON PINK	PURPLE	BLACK

Every bulb guaranteed to bloom. The finest stock obtainable, directly from the Holland bulb fields, selected and packed abroad to your order at harvest time. Shipped postpaid, terms cash with order.

At Schenley Gardens, Aspinwall, Pa., we test all bulbs thoroughly. All during the season we will exhibit growing stocks of a complete assortment of bulbs and perennials. We cordially invite you to visit Schenley Gardens during the blooming season and select your bulbs from the flowering exhibits. Begin today to have a garden full of color.

"Beautiful Gardens at Moderate Cost"

FREE! A real garden manual with complete cultural directions for planting. A special study of colors and their effect. A complete description of our full stock of bulbs with attractive color illustrations. Well worth having if you want a garden or have one. Ask for your copy when you order your bulbs or send coupon today.

By July 1st

All orders must be in our hands by July 1st, so that we may select your bulbs at harvest time in Holland. Bulbs will be shipped to you in time for fall planting.

SCHENLEY GARDENS N-1
Cheswick, Pa.

Please send free copy of "Beautiful Gardens at Moderate Cost."

Name_____

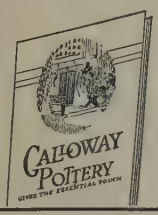
Street_____

City_____ State_____

GALLOWAY POTTERY

BIRD BATH No. 371, 32" high, as illustrated, in light stony gray, $22.00, f. o. b. Philadelphia.

Our collection of high-fired, strong and durable Terra Cottas includes shapely jars, flower vases, pots, boxes, gazing globes, sundials, benches, and other interesting garden accessories.



Attractive booklet featuring 64 popular numbers sent upon request.

GALLOWAY TERRA COTTA CO.
3236 WALNUT ST. PHILADELPHIA.

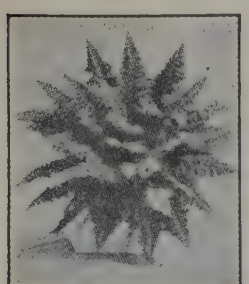
Order By Mail A Rose Arbor From Fiske

Fiske Rose Arbors add charm and beauty to the garden. Galvanized rust-proof, they stand up for years. Always neat and trim. Free catalog, 523, of Garden Furniture on request. Order today in time for roses.

No. 23.—18 inches wide to span 4 ft. walk . $13.00
No. 23.—30 inches wide 16.00
F. O. B. New York City.
Mail orders shipped promptly.

J.W. Fiske IRON WORKS
ORNAMENTAL IRON WORK
80 Park Place ~ New York
ESTABLISHED 1858

YOU CAN GROW BEAUTIFUL



FLOWERS FERNS PLANTS

By Using ZENKE'S

"New Plant Life"

(LIQUID)

1 Teaspoonful in 1 quart of water when watering plants.

MANUFACTURED BY
THE EXCELL LABORATORIES
4535 Ravenswood Ave.
CHICAGO

At your Florist or postpaid, one pint can 60 cents

Bird Haven Donated

One of the finest country estates in the vicinity of Boston has been presented to the New England Federation of Bird Clubs as a gift to be maintained as a sanctuary for birds and other forms of wild life. This is the gift of Gorham Brooks, Mrs. Robert W. Emmons, 2d, and Mrs. James Jackson, the son and daughters of the late Shepherd Brooks and his widow, Mrs. Clara G. Brooks, of Boston. The estate is the ancestral home of the family in Medford and Winchester, Massachusetts, and comprises more than eighty acres of rolling country, forested in spots. It will be known as the Shepherd Brooks Wild Life Sanctuary.

Museum Inaugurates Courses

To acquaint laymen with its extensive scientific collections, the Cleveland (Ohio) Museum of Natural History has inaugurated a series of courses for adults. Two have been projected, one on the birds of the world and one on fossil fishes of the Cleveland region. A fee of $2 is charged for each course of four weeks. Sessions will be held once a week at the museum, and each class will comprise about 10 persons. Members of the museum staff will be the instructors. The museum's collection of approximately 10,000 birds and its excellent collection of fossil fishes will be utilized.

Billboards or Scenery

In 1918 the people of Massachusetts voted to amend the State Constitution to permit the regulation of billboard advertising. Subsequently a law has been passed, effective last year, prescribing regulations. There has been an active fight against these regulations and the billboard interests have carried the contest to the State Supreme Court on grounds of constitutionality. The Massachusetts Billboard Law Defense Committee has been organized to finance the defense of the law, even as far as the United States Supreme Court if necessary. The secretary of the committee is Mr. E. T. Hartman, 3 Joy Street, Boston.

Our New Catalog Folder of Trellises Pergolas and Arches Sent FREE to You

Shows how to beautify your home and lawn at surprisingly low cost. Think of it! Fan Trellises as low as $1.10. Many other styles from $1.40 to $2.70. We show here just a few of the many beautiful designs we make—all painted white, ready to put up about your house or yard. Send for the Free Folder today. Plan now to have "New Beauty Spots" for your home this year.

Fan Trellis
as shown only
$1.10

Adjustable Trellis
Fine for Roses
$1.55

Star Trellis
A beauty
$2.70

Brooklyn Arch
with cozy seats
$12.15

ROWE MFG. CO. 325 Holton St. Galesburg, Ill.

5 FINEST MONTHLY ROSES $1.95 Postpaid

Strong-Rooted, 2- or 3-year-Old Bushes; Nearly 2 ft. High

To Add Quickly 1000 Customers

we make this remarkable SPECIAL OFFER on the finest, fragrant varieties:

COLUMBIA, newest big pink; GOLDEN OPHELIA, rich yellow; PREMIER, rose pink; DOUBLE WHITE KILLARNEY, ivory white; AMERICAN LEGION, fragrant new deep red.

Every bush has already bloomed.

GUARANTEED

TO GROW AND BLOOM
For You, or Money Back

Pick regular, long-stemmed hot-house roses all summer and until frost comes.

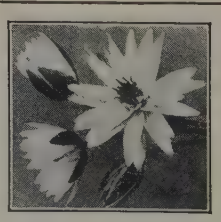
ACT NOW Low price holds good only till limited number of collections is sold. Send $1.95 today—all five bushes mailed postpaid to your home when planting season opens. If beyond the Mississippi River, add 10c.

FREE *Collins 1926 Guide to Roses, Evergreens, Fruit, Grape Vines, Berry Plants, etc., in colors.*

COLLINS NURSERIES

Established 1860
Arthur J. Collins & Sons, Inc.
Box 96. MOORESTOWN, N. J.

400 acres in nurseries and fruit trees



WATER-LILIES

Can be planted in Spring for beautiful blooms this Summer, Rich colors, refined fragrance, hardy big roots—over 75 varieties—the rarest and fairest from the largest Water-Lily Garden in the country Easy to grow. Send today for Catalog.

THE W. B. SHAW
Aquatic Gardens
Kenilworth, Washington, D. C.

Tree Doctors Meet

Modern medical science has been the product of great progress during the past few decades. It has surmounted tremendous obstacles and made life a happier thing all around. One of the things that contribute to happiness is the tree. In about the same period as that of medical progress the people have come to have a growing and sincere appreciation of trees. An affection for trees as living things has grown up. That they have ailments, as do humans, has become recognized. These ailments can be treated by the tree doctor or surgeon and the last quarter century has seen the tree doctor called to the rootside of many a tree and minister successfully to its ills. That this is an extensive practice is testified to by the celebration of its silver anniversary by the Davey Tree Expert Company of Kent, Ohio. So great was the gathering at the banquet that there was no meeting place in Kent sufficient and the State Armory at Akron had to be pressed into service.

Plant Christmas Tree

With the coming of spring and the warmth it promises, the Christmas tree may seem an inappropriate thought. Mrs. Warder Irwin Higgins, of Butte, Montana, does not feel so, however, and makes an interesting offer. Mrs. Higgins, incidentally, is the active chairman of the Forestry and Outdoor Art Committee of the Montana Federation of Women's Clubs, and her plan is in line with the fine work she has been doing for a number of years.

In order to encourage the planting of more evergreens for illumination at Christmas time, to further the idea of community Christmas trees and to discover just how extensive the living tree idea has been followed, Mrs. Higgins offers two prizes of $10 each. The first is for the best photograph of a living community Christmas tree accompanied by a description of the lighted tree if the picture does not show the Yuletide garb. The second prize is for the best photograph of a living home Christmas tree decorated so that it will set forth the story of the Nativity.

Mrs. Higgins requests that all pictures be accompanied by a description, have the name of the contest plainly written on the back and sent to Mrs. W. I. Higgins, 3014 Sheridan Avenue, Butte, Montana, before February 1, 1927. Pictures will not be returned unless accompanied by return postage but will be used to accompany articles on this work and for Women's Club programs.

A Garden Full of Dahlias for $3.50

New and Rare Exhibition Dahlias

Few flowers, whether used for garden decoration or principally for cut blooms to decorate the home, are as responsive to simple garden culture as our Modern Dahlia. It has made wonderful advancement in size of bloom, habit of growth and profuse blooming qualities.

In order to further its now great popularity, we are offering this collection of

12 Dahlia Tubers for $3.50

—one each of 12 distinct varieties, not labeled, which if purchased separately according to name would cost not less than $10.00.

Order Your Tubers Now so as to have them ready to plant any time after the tenth of May or when all danger of frost is past.

Mention this advertisement, and send check, money order, cash or stamps, or call at our store, and secure this exceptional collection, sent prepaid to any point in the United States.

Our 1926 Spring Seed Annual sent on request

Stumpp & Walter Co

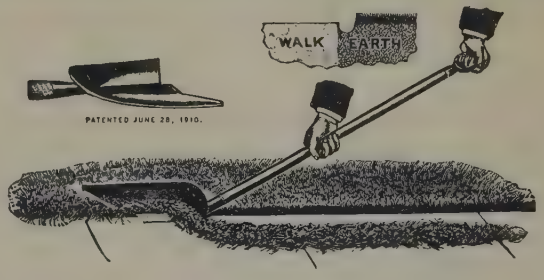
30-32 Barclay St. N. New York City

$2.00

WILL DELIVER THIS

Lightning Lawn Edge Trimmer

TO YOUR DOOR



Will last for years. One of the handiest lawn tools ever devised. With this tool the rough, straggling, overhanging grass along the edges of the walk can be trimmed in a few minutes. It plows a clean "U" shaped trench, delivering the cuttings on the sidewalk. The edges along the curb and walk of an 80-foot lot can be trimmed in twenty minutes.

Order one today. It will save your back, temper and time. Send for catalogue.

MAYO-BELDEN COMPANY, Inc.

Orchard, Garden and Lawn Supplies - - Rochester, N. Y.

BECOME A LANDSCAPE ARCHITECT

Dignified, exclusive profession. Little competition. $5,000 to $10,000 incomes for experts. Easy to master under our correspondence methods. Assistance extended to students and graduates. Write today for full details.

American Landscape School, 83-HA, Newark, New York

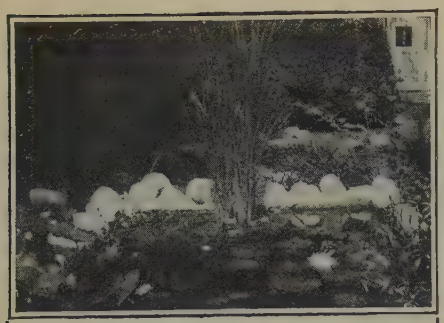
Better Than a Maid

Every *maidless* housewife should have this Table Service Wagon. Enables her to entertain easily without a maid. Saves thousands of needless steps and speeds up housework. Endorsed by leading magazines.

FREE—*Write* for "Entertaining without a Maid," descriptive folder, and Special Offer where we have no dealer.

COMBINATION PRODUCTS COMPANY
Dept. N-500 Cunard Bldg., Chicago, Ill.

Tell our Advertisers you saw their Ad in Nature Magazine



Colored Waterlilies

In Carmine, Blue and Gold

are just as easily grown in a backyard pool or tub as the usual white kinds.

3 FINE HARDY WATERLILIES FOR $6.00

Quality Trio—James Brydon, red; Rose Arey, pink; Gladstone, white—**One of each for $6.00.**

Goldfish and other ornamental fishes keep the pool clean and fresh. A pair of the Famous Chinese Walking Fish for **$5.00.** Our catalogue offers many kinds.

Our 1926 Waterlily Catalogue tells how to make simple pools and how to grow Waterlilies successfully. Write for a copy.

The Independence Nurseries Co.
Box D, Independence, Ohio

FREE PRACTICAL PLANS

DESIGNED WITHOUT OBLIGATION

Let us design an individual blueprint planting plan **WITHOUT COST OR OBLIGATION,** to suit your particular grounds, and which enables you to plant accurately and satisfactorily for beautiful effects.

Whether it be the small bungalow, large estate, park or rearrangement of old grounds.

DEFERRED PLANTING

Your plan **IF ACCEPTED** can be completed over several years. **Hundreds Are Now Doing** this. Prepare your sketch and information on our copyrighted **SKETCH BLANK AND INFORMATION SHEET** contained in catalogue.

SPECIAL OFFER—50 choice gladioli—mixed—for only $2.00 prepaid.

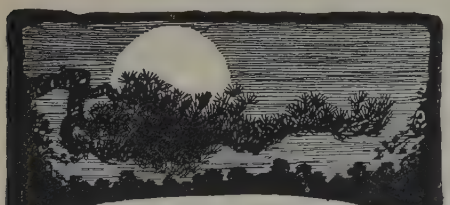
"EVERYTHING FOR THE GARDEN AT LOWEST PRICES AVAILABLE!!"

HIGH GRADE Fruit, Ornamental Trees, Shrubs, Roses, Evergreens, Vines, Perennials, Peonies, Gladiolus, Dahlias, Grass Seed, Fertilizer, Garden Tools and Garden Furniture, Etc.

WE PAY ALL TRANSPORTATION CHARGES

Send for Free Illustrated Catalogue

J. OTTO & SON NURSERY COMPANY
Dept. N-1 142 Nichols St. Rochester, N. Y.



Next Month Is Rose Month

ARE you prepared for a harvest of beautiful blossoms from your own garden?

Now, during May, you can plant Moon's potted Roses with the expectation of abundant blossoms this June.

Moon's Roses are fully and accurately described in our complete illustrated catalog.

Ask for Catalog N. Free East of the Mississippi

Moon's Nurseries
THE WM. H. MOON CO.
MORRISVILLE, PENNA.
One Mile from Trenton, New Jersey

Fireflies

Mr. F. K. Shield, principal of Fairmount School of Hackensack, New Jersey, sends us a verse of unusual charm. It came unsolicited as a result of Nature study in the school and is the work of Barbara Wood, ten-year-old, of Grade 6-A. Are we wrong in predicting a coming Nature poetess after reading Barbara's verses? They go:

A little light is going by,
Is going up to see the sky,
A little light on wings.

I never could have thought of it,
To have a little bug all lit,
And made to go on wings.

The Stag at Eve

Evening was darkening the glow of a January day in the Yosemite National Park. Enid Michael, Nature Guide in the Park, chanced to look out of the window in time to see a doe wandering leisurely through the oak grove closely followed by two stags. Writing in the Yosemite Nature Notes, she tells what came to pass.

"The stags were both full-antlered, and the smaller of the two was in the lead. When just opposite the window and not two hundred feet away the larger buck apparently issued some sort of challenge; the smaller one turned and bleated a protest, and then stood waiting with head lowered to accept the challenge of his rival.

"The larger one stepped deliberately forward until there was a clashing of antlers. Both animals then fenced until their horns locked. With horns locked they struggled about, shoving and pulling. Several times the lock was broken, only to have the stags fence again for a new hold. Sometimes the smaller animal appeared to have the best of the fray, backing the larger animal away, but most of the time the big one had the advantage and several times he almost had his smaller adversary on his knees.

The struggle lasted a full five minutes and toward the end the smaller animal was being tossed, shoved and dragged about in no gentle manner. The smaller deer was apparently the more agile of the two and when he recognized defeat he took advantage of the first unlocking of horns to leap skillfully backward out of range. The other one seemed to consider this gesture as an acknowledgment of defeat and with one contemptuous glance at his late rival he strode deliberately on in the direction taken by the doe. And, by the way, the doe showed not the slightest interest in the struggle."

Improve Your Soil—

For Lawns, Gardens Trees and Shrubbery

The soil requirements of plants differ greatly. We have studied this question carefully. Write us about your soil problem; we'll give you the benefit of our experience.

Hyper-Humus—Odorless—Weedless

1 100-lb. Bags $1.50 4 100-lb. Bags $5.00
1 Ton in Bags 20.00 All prices f. o. b. plant

Free Booklet "Soil Improvement"

gives precise directions for using Hyper-Humus. Write for it.

If you grow Rhododendrons, we can help you succeed. Ask about Rhodo-Gro.

HYPER-HUMUS COMPANY
Dept. 22 Newton, New Jersey

Hyper-Humus
TRADE MARK REGISTERED
"Puts the Top in Top Soil"

KINKADE GARDEN TRACTOR

and Power Lawnmower

A Practical Proven Power Cultivator for gardeners, suburbanites, Truckers, Florists, Nurserymen, Fruit Growers, Country Estates and Lawnwork.

Catalog Free

AMERICAN FARM MACHINE CO.
1036 33rd Ave. S.E., MINNEAPOLIS, MINN.

MIRAKEL

Telescopic Vision

5-Power

$25

MIRAKEL PRISM BINOCULAR:
Once focused, focused for Life and For All Distances—20 feet, 20 yards, 20 miles!

Price includes soft pouch or shoulder strap case

Microscopic Vision

20-Power

$2.50

MIRAKEL MAGNASCOPE
Attachment lens converting Mirakel Binoculars into a 20-power microscope, suitable for identification of nature specimens.

Strap case with belt and lens pocket attachments 50c extra

MIRAKEL DISTRIBUTORS
1214 16th St. Washington, D. C.

SEND CHANGES OF ADDRESSES PROMPTLY

Report on Flamingos

"There outlined against the evening sky, floated a wonderful rosy cloud. The sun had slipped behind the palms in the west and even as I looked the thing was no longer a cloud; as by magic it became a pillar of flame, a mighty, rushing, palpitating mass, which as it swept grandly by mid a thunder of wings burst into a wild clangour of clarion notes—and was gone. Slowly the vision faded, melting into the tender blues and greens of the eastern horizon, till it became but a wisp of crimson flame, blown from the heart of a sunset."

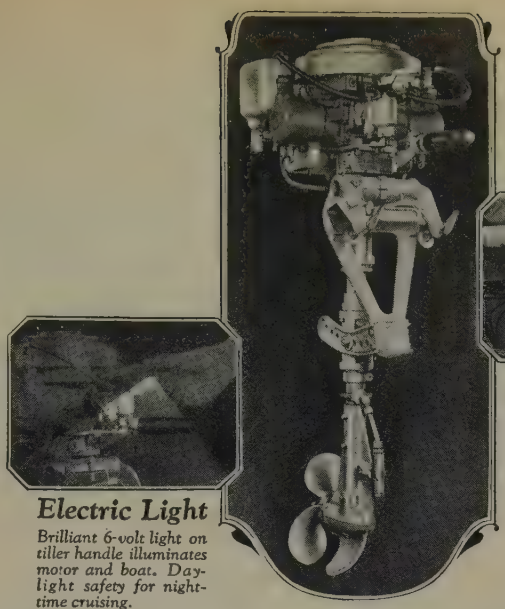
With these words Warden E. W. Forsyth, of Andros, Bahama Islands, closes his report on the state of the flamingo and the results of protection as printed in the *Nassau Guardian*. We are indebted to Miss Harriet Gaylord, of Yonkers, New York, for calling this interesting report to our attention.

Warden Forsyth tells of days of discouraging search for flamingo rookeries. Reports of vast flocks were received but that was all until a five-pound note offered as a reward brought forth an iguana hunter with a real report. He led the searchers not to one rookery but to two, built upon the banks of adjacent ponds at the extreme southwest tip of Andros. There were fully 1,500 birds in the two rookeries. The situation, the Warden says "was ideal, with beautifully protected feeding ground where the young birds stepped literally out of the nursery into the dining room and throve amazingly thereafter on a diet of concentrated clam broth." He continues:

"The contrast between these two rookeries was extraordinary, the larger being made up entirely of the crudest efforts at masonry I have ever known flamingos to be guilty of. Mere mouldy mud huts these, as compared with the stately palaces of the adjacent city, many of which were veritable sky scrapers, built of whitest chalk.

"We concluded that the bigger settlement was the home of flighty young birds of large conceit and small experience, the flappers of flamingodom turned out by their elders who could not put up with the airs of a vain and sophisticated rising generation.

"Thus, left to their own devices, they at the last minute hastily scraped together a collection of grass, sticks and leaves, cementing the whole together with dirty mud scraped out of cavities in the rock on the side of a long pond. So little judgment did they use that dozens of nests built on too low a level were either washed away, or completely submerged by the early rains in June and here most of the infant mortality must have occurred. In spite of all this, however, the



Quick Starting
As sure as your car. Ford type ignition—start, run on either battery or magneto. Easy (rope) Starter—no cranking.

Plug in battery as easily as your radio loud speaker. Battery current transformed into sure-firing current of 13,000 volts.

Electric Light
Brilliant 6-volt light on tiller handle illuminates motor and boat. Daylight safety for nighttime cruising.

Announcing Evinruding De Luxe

12 New Features that Make it a Fact!

THE New 1926 Champion EVINRUDE Sport Twin. Valveless, practically vibrationless twin cylinder motor. Light weight of only 44 pounds. Two to ten miles per hour. Introducing startling improvements overshadowing all previous conception of what an ideal outboard motor could be.

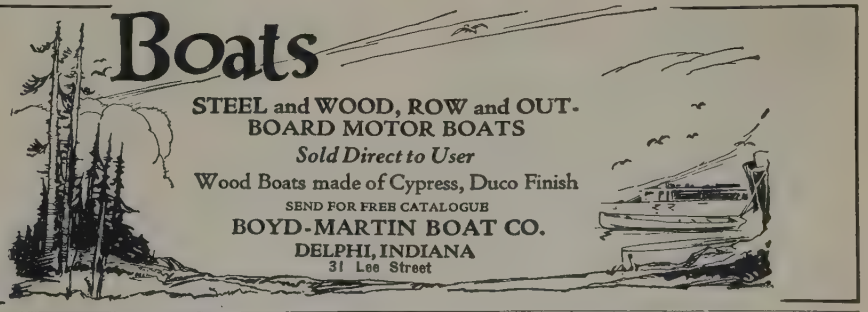
For the first time, modern automobile conveniences can be enjoyed from an outboard motor. In addition to Electric Lighting and Dual Ignition, we have ten other features, among which are:

1. New, automobile type carburetor, giving special mixture for starting, trolling and speeding.
2. Rope Steering, in addition to tiller steering, giving control of direction from any part of boat.
3. Self-Steering—boat held on fixed course, both hands free.
4. Built-in Lock cylinder type, preventing unclamping of motor when left on boat.
5. Extra Shear-Off Pins housed in propeller like leads in an automatic pencil.

Advance showings of the New 1926 Champion EVINRUDE Sport Twin have created such a sensation that our production capacity is being taxed to the limit. See your Evinrude dealer at once to make sure of delivery. Write for the Evinrude Year Book describing "Evinruding De Luxe" in detail.

EVINRUDE MOTOR CO., 508 EVINRUDE BLDG., MILWAUKEE, WIS.
There is only one Evinrude Motor Co. Any other use of this name is a deliberate attempt to confuse.
Also makers of the world-famous Evinrude Single and Big Twin (4 H. P., 10 to 15 miles per hour) and Evinrude Camp Stoves.

The New 1926 Champion
EVINRUDE
Sport Twin



Boats

STEEL and WOOD, ROW and OUTBOARD MOTOR BOATS
Sold Direct to User
Wood Boats made of Cypress, Duco Finish
SEND FOR FREE CATALOGUE
BOYD-MARTIN BOAT CO.
DELPHI, INDIANA
31 Lee Street

KARBOAT FROM CASE TO WATER IN 8 MINUTES

Solid wood boat. No bolts, screws or small parts. Carries 3 full grown men. Can be taken on street car. Very strong. Easy to row. Hard to tip. Four men used one every day for 5 weeks on Lake Michigan. Bone dry. Carries outboard motor. Carries on running board of Ford. Interesting catalog.
KARBOAT MFG. CO., 1611 W. Wash. Blvd. CHICAGO

number of young surviving was a sight to gladden the hearts of the wardens, who had been almost driven to despair by the long and unsuccessful quest of months past, when it seemed that all was lost which for two years we had so painfully struggled to gain."

The wardens made camp and set about to protect the young birds, undaunted by the arrival of swarms or bloodthirsty mosquitos. Warden Forsyth estimates that about 1,500 young birds were reared. He also believes that the birds of South Andros have been added to by birds from Wide Opening or possibly from Cuba. "By the wonderful telegraphy of Nature," he suggests, "the Cuban flamingos may have learned that security is to be found in Andros." Mr. Forsyth pays particular tribute to Dr. L. C. Sanford, of New Haven, Connecticut; to Dr. T. Gilbert Pearson; to the Governor and to the legislature for their cooperation which has resulted in redeeming the number of flamingos from a vanishing tribe of 2,500 to a growing species of upwards of 5,000.

A Mystery Solved

By Albert A. Hansen

The cause of the yellow color in the golden oak that has been so highly prized by furniture makers has been a mystery until recently. Investigations have disclosed that the golden gleam is due to the presence of a lowly fungus, similar in nature to fungi that cause so many serious plant diseases and that are responsible for various heart-rots of trees. From a specimen of seasoned heartwood of oak that showed yellow coloration a fungus was isolated and inoculated into chestnut wood. In both cases a marked golden color developed.

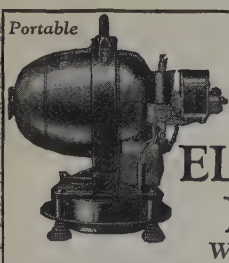
A study of the nature of the fungus revealed that it probably does little harm to the wood and can be considered as beneficial rather than harmful, its value lying in the rich golden hue imparted to the lumber. Since there are fungi that produce blue and other colors in wood, iridescent furniture may be the fashion of the future.

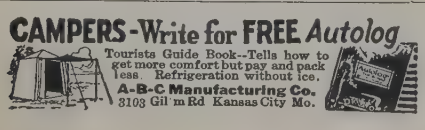
Ice Floes Notwithstanding

Franklin and Oil City, Pennsylvania, have not long since been battling with ice choked river and drenched with flood. Notwithstanding these cavortings of the elements "Jim" Borland finds reassurance in the appearance of birds and records it in his delightful column in the *News-Herald*. He writes that "the birds were having

Dual Ignition
Five Speeds
Twin Cylinders
Light Weight
Power
Speed
ONLY $29.00 DOWN
You couldn't ask for a single outboard motor advantage that is not embodied in the
CAILLE DETROIT 5 Speed Twin
Perfect control. Go forward or backward—fast or slow—or stop boat at pier and leave motor running.
Dual Ignition
Gives you both battery and magneto ignition. Change from one to the other by simply withdrawing plug without stopping motor.
"Pay As You Play"
Buy on time if desired. Only $29.00 down. Send for catalog and name of nearest dealer.
The Caille Perfection Motor Co.
6213 2nd Blvd.
Detroit, Mich.

Push
NO MORE
Just
Follow and Guide
Now the home-owner's last hard job is abolished forever — no more pushing a heavy hand lawn mower on a hot day. All you need do is to follow and guide this new wonderful little motorized mower that runs itself —
BOB-A-LAWN
The Pushless Lawn Mower
Easy pull on starting cord and engine starts. Slight pull on control handle and mower starts. Does everything a hand mower will do, and more. Boy or girl can operate it. Cuts on hill or terrace; heavy or light grass. Very low cost. Send for free folder.
Power Units, Inc., 648 Jackson St., Jackson, Mich., east of Mississippi River; Cushman Motor Works, 1008 N. 21st St. Lincoln, Neb., west.




CAMPERS-Write for FREE Autolog
Tourists Guide Book--Tells how to get more comfort but pay and pack less. Refrigeration without ice.
A-B-C Manufacturing Co.
3103 Gil'm Rd Kansas City Mo.

Outodoor TOURING TENT — DE LUXE
The TENT of Tents
Waterproof—Mildewproof—Stormproof—Bugproof—Troubleproof
ONE PERSON SETS IT UP
The DE LUXE Umbrella Tent is truly the tent of tents. Waterproof and mildewproof beyond the need of ever retreating. Waterproofing quality not injured when washed with soap and water. Always soft and pliable. Highest Grade olive drab tightly woven fabric that money can buy. Maximum Ventilation front and back yet stormproof and bugproof.
The De Luxe is the only tent entirely supported by a light, strong, folding steel frame. Patent applied for. Umbrella Tents, Wall Tents. Portable Cottages, Camp Furniture, etc.
No center Pole. Every inch of tent usable. Patented double door either screened or stormproof at a moment's notice. Clumsy fastenings all eliminated.
Supreme in case of set-up, roominess and comfort.
Write for catalog
COSTS LESS
By Comparison
United States Tent and Awning Co.
Tent makers for 40 years
728 N. Sangamon St. Chicago

Table for 6. Folds like this to 6 x 6 x 36 ins.
Roomy Cot. Folds to 31-4 ft. x 4 x 6 ins.
Sturdy Chairs. Fold like this
So Easy Now
To Take Along
COMFORT
—on every tour or camping trip. Pratt-Fold Table, Bed and Chairs fold away neatly and open up roomily. They stow away almost unnoticed with your other luggage and enable you to
—Eat in Comfort
—Sleep in Comfort
—Sit in Comfort (2)
Write for Free Catalog Folder today.
PRATT MANUFACTURING CO.
Dept. 7 Coldwater, Mich.
PRATT-FOLD
CAMP FURNITURE

IF YOU SUNBURN
Try NOBURN next summer. This harmless, magic liquid positively prevents sunburn. Over 100,000 outers have used it successfully. Order a bottle now. Pay $1 when convinced. NOBURN must make good *before* you pay. Strong, Cobb & Company, 347 Central Viaduct, Cleveland, Ohio

a joyful time down by the river on Wednesday morning. In addition to numerous Song Sparrows and Bronzed Grackles, I also heard the cawing of several Crows, while the bird most in evidence was the Phoebe, or Water Pewee. Their two notes sound as though spelled 'Pee-wee,' with the accent on the last syllable. The males are the first to come, and they must be lonesome until their tardy mates arrive, as this is one of the birds that are said to mate for life. They are also said to be devoted lovers, and why they should not travel together on their journey is another of the many mysteries of bird-life awaiting solution.

"I heard the Nuthatches, too, the notes of which appear to me to have more volume to them in the early Spring, but maybe that is because their 'Quank, quank, hank, hank' is not drowned out by the songs of other birds. Our annual early Spring visit from the Gulls occurred down about the confluence of the creek and river a week ago. And the family of Mallards continues to call French creek home, so, with most of the ice gone, we have nothing to worry about."

The Character of Trees

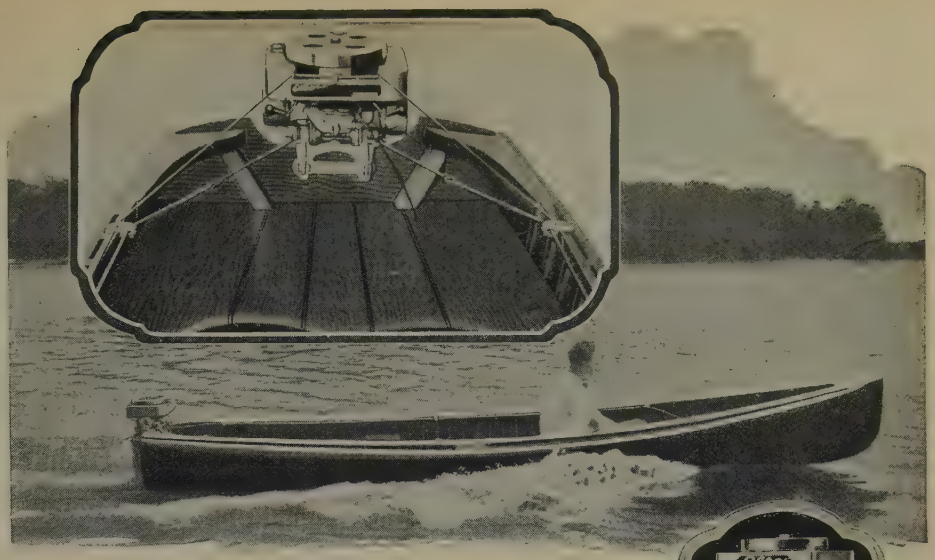
One of the most attractive articles in the March issue was that entitled "The Character of Trees," credited to Mr. Wallace Hutchinson, of the California office of the United States Forest Service. By a curious confusion of identity so crediting the article was to rob Mr. William E. Hutchinson of Berkeley, California, of the appreciation due him for writing it. Both Hutchinsons are excellent writers, but William E. turned out the work in the article in question.

Cephalodiscus

By Capt. J. Menander

Modern oceanographic research was inaugurated by the English Challenger Expedition (1872-76), and many new species of animals and plants were found and classified by the scientists of that expedition.

One of the forms of animal life that was seen by man for the first time on board the *Challenger*, is the exceedingly unique little marine animal, called Cephalodiscus, which was discovered in the Strait of Magellan in 1875. This creature is of great interest to biologists, because of its peculiar anatomical structure and its apparent relationship to various zoological groups. Several years passed after its discovery before more species were brought up from the bottom of the sea, this time in the scrap-



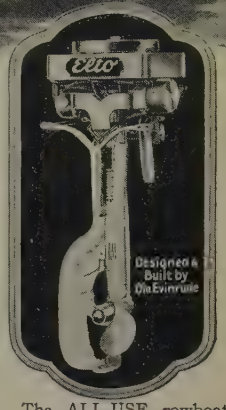
Steer and control motor from any part of boat!

SIT where you choose! Ride on an even kell. With the Super Elto the bow of your boat need not stick up in the air, swinging the boat like a weather vane at every gust of wind.

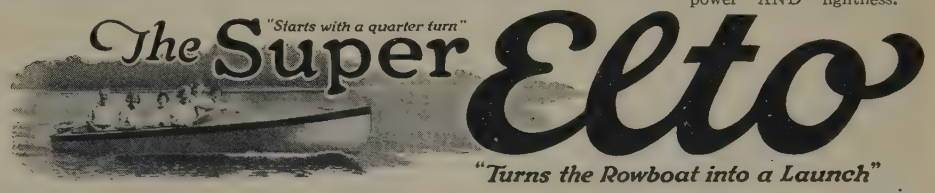
The Super Elto frees you from the stern seat—from throbbing steering handles. With the Super Elto you steer, speed up, slow down or stop from any part of the boat. You can "trim ship" for safety, for speed, for seaworthiness and boat manageability. Only Elto gives this—as only Elto gives the safety of full rudder steering—and a dozen other outstanding advantages.

The beautiful Elto catalog—profusely illustrated, highly informative and genuinely helpful in the selection of a motor—will be sent free to you on request.

Elto Outboard Motor Co.
Ole Evinrude, President
Dept. 61, Mnfrs. Home Bldg.
Milwaukee, Wis.



The ALL-USE rowboat motor—a masterful combination of speed AND power AND lightness.



New! LA TWIN MOTOR FOR ROWBOATS

The sensation of the year. Offering new advanced features in Power, Speed, Control, Weight and Performance. For example—

NEW—Super-Power Twin Motor—At normal speed develops 3.85 H. P. [Brake Test]. In racing trim develops 4.65 H. P.

NEW—Under-water Stream-Line Design
—Cuts the water like a knife
NEW—Giant Drive Propeller
—Gives flashing speed
NEW—"Safety Propeller"
—Protects Boat, Boaters and Motor
NEW—Super-charged Water Pump
—Insures a cool motor always at all speeds and reverse
NEW—Combination Propeller and Rudder
—Steers WITHOUT A RUDDER!
NEW—Unit Control Carburetor
—One easy adjustment for all speeds and weathers
NEW—"Top-Spin" Easy Starter with big Eiseman Magneto
—Gets you away in a flash
NEW—Combination Racing and Trolling Control
—One throttle lever for all speeds
NEW—Lifetime Guarantee
—Against all defects in material and workmanship
NEW—Five Days' Trial Offer
—Gives you a chance to match with any other Motor

[WRITE FOR FREE CATALOG FOLDER TODAY [1]

LOCKWOOD-ASH MOTOR COMPANY
615 Jackson St. Jackson, Mich.

Thompson BEATS the World on BOATS Fastest Of All Boats for Outboard Motors

And a complete line of other boats at real money-saving prices. Prompt shipment from either of our two factories to you.

Canoes $48.00 and up

Rowboats $44.00 and up

Outboard Motor Boats $48.00 and up

Motor Boats $350.00 and up

CATALOG FREE— SAVE MONEY— ORDER BY MAIL
Please state the kind of boat you are interested in (18)

TWO LARGE FACTORIES

THOMPSON BROS. BOAT MFG. CO.
428 Ellis Ave. PESHTIGO, WIS. (*Write to Either Place*) 1228 Elm Street CORTLAND, N.Y.

Tents

that ADD to your Camping Joys

Because they embody every worth-while Tent improvement and refinement.

On your motoring or vacation trip carry the ever-popular BROOKS and be sure of the fullest enjoyment of your outing. No other tent so wholly desirable for every occasion.

Brooks
SQUARE UMBRELLA Tents
TRADE MARK REG. U.S. PAT. OFF. PATENTS PENDING

Give you thoro protection.
Neat, roomy, comfortable.
Simple, compact and light.
Wonderfully strong, durable.
Many exclusive features.

Write for Brooks Camp Catalog, Road Maps and Nearest Dealer.

BROOKS
Tent & Awning Co.
1665 Arapahoe Street
DENVER, COLORADO

You Can Sleep Outdoors in Perfect Comfort with a

FIALA PATENT SLEEPING BAG

Scientifically Correct

Made like the fur of an animal, it retains the body heat, **but not the moisture.** No dead air spaces to become foul or soaked, as in a closely woven or filled fabric. Weighs about 5 lbs. . . $5

"You have the best lightweight bag made."—Dr. C. P. Fordyce.

Mirakel 5x Prism Binoculars; genuine Jena; Explorers 5 oz. with case $25

Imported and Domestic Shotguns and Rifles; Camping, Hunting, Touring, Engineering & Exploring Equipment.

Let us furnish estimates

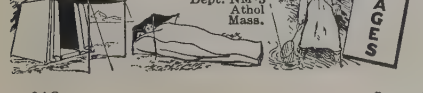
Write for Folder W

FIALA OUTFITS, Inc.
25 Warren St. New York

Get FREE BOOK "Comfortable Camping"

It shows what YOU need! New Folding Boat, Whall's Tents, Air Mattresses, Sleeping Robes, Fishing Capes, Waders, etc. Pocket size; many pictures. Write now.

METROPOLITAN
Camp Goods Folks
Dept. NM-3
Athol
Mass.



16 PAGES

ers of the Swedish Antarctic Expedition from the coastal banks of the Antarctic Continent, south of Cape Horn, in 1902.

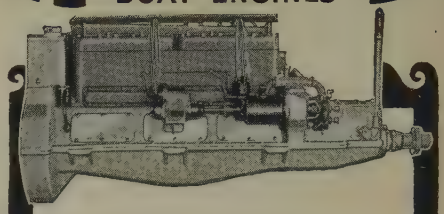
Cephalodiscus is a colony-forming animal, living like the corals in tubes of some brown, semi-transparent substance. This shell, with its numerous, branching channels, often grows to a length of several inches, and the diameter of the tubes is about the size of a match. Each tube harbors a minute little animal. In the case of the corals the animals that form the colony are united one with the other, so that nutriment, received by one individual, is distributed through the entire colony. But not so with the Cephalodiscus. These animalculi have developed a little farther, so that each individual is separated from his neighbors, and also to a certain degree independent of his house. The Cephalodiscus has been named from a tiny disc in front of its mouth that serves as a foot, and allows the wearer to crawl out of its hiding place in search of food. The anterior part of the body is equipped with a thin, elastic string that ends in another disc which connects the animal with the inside of its tubular living quarters. If the creature is disturbed on its foraging expeditions, it simply has to let go the hold of its foot and the elastic string jerks it back indoors and out of harm's way.

Outdoor Schoolrooms

"Every community should maintain a wild life area, the larger the better, similar to our National Parks," says Dr. William G. Vinal, Professor of Forest Extension, New York State College of Forestry, Syracuse University. Wild life areas are of great value, as outdoor schoolrooms. They are important for their scenic attractions and as places where forestry may be demonstrated and the study of geology, wild plants, and animals may be carried on. They serve as game refuges, provide fishing, preserve native wild flowers, and afford opportunities for camping, scouting, and nature photography. They furnish a health resort, a refuge for tourists, and a playground for picnic parties. All of these features are important and inter-related.

"We must preserve all our native wild life for the future as well as for the present generations," says Dr. Vinal. "Most of our large mammals, game birds, and many native wild flowers are in danger of extermination. We must preserve the balance of Nature in every wild life area. To do this we must prevent pollution, fish diseases, fire hazards, and the introduction of new pests. Some pests which

KERMATH
BOAT ENGINES



Are Adaptable to Any and Every Marine Purpose

The Kermath Two-Cylinder Motor is suited particularly for auxiliary yacht work. The 4-cylinder 20 is ideal for use in small runabouts up to 20 to 25 feet in length and gives satisfactory speeds of from 14 to 20 miles per hour. The 6-cylinder 100 H.P. is just the motor for the new fast runabouts of from 26 to 30 feet, and is used to advantage in light, fast cruisers.

Altogether there are 14 different sizes and types of motors in the Kermath line, a motor for every marine purpose.

Write us for full details and specifications.

3 to 150 H.P.
$135 to $2150

KERMATH MANUFACTURING COMPANY
5897 Commonwealth Ave., Detroit, Mich.
11 E. Wellington St., Toronto, Ontario
50 W. 17th St., New York, N. Y.

A Kermath Always Runs

THE OUT-OF-DOORS IS CALLING YOU!

Get a Carpenter Tent and camping equipment; tune up your car and answer the call—take the whole family along.

Send for catalog No. 601 and get the whole story. It's FREE!

Contains a splendid chapter on auto camping.

GEO·B·CARPENTER & Co.
Tent Makers for Eighty-five Years
440 N. Wells Street Chicago, Illinois

CANOE CATALOG FREE

20 pages in colors. New line includes "Joy-Boy"—new type outboard motor canoe. Also boats and equipment. Write for your copy now.

Kennebec Boat & Canoe Co., Dept. T-12, Waterville, Maine

have been recently introduced into our wild areas are chestnut blight, white pine blister rust, gypsy and brown tail moths, and English starlings. The introduction of these foreign species from Europe has upset the balance of Nature wherever they occur.

"Community wild life areas must be governed for the good of the people, free from politics. They should be rendered accessible by scenic roads and trail systems, campers should use only dead wood for fires in designated places; there should be free Nature guide service; approved sanitary arrangements are indispensable; outdoor sports should be encouraged. Artificial amusements such as dancing and merry-go-rounds should be prohibited."

Bag Limits Reduced

The Federal daily bag limits on a number of migratory game birds have been reduced under an amendment to the migratory-bird treaty act regulations adopted by the Secretary of Agriculture and approved by the President on March 8. Hunters who formerly enjoyed a limit of not to exceed 25 Wilson snipe or jacksnipe a day may take only 20 under the new regulations, when the fall shooting season arrives. The limit on sora has been reduced from 50 birds a day to 25, and on rails and gallinules except sora a bag limit is prescribed of 25 in the aggregate of all kinds but not more than 15 of any one species. A daily bag limit of 25 is fixed for coots. The season on black-bellied and golden plovers is closed indefinitely. These reductions and close seasons apply throughout the country, regardless of any State law which may allow greater privileges.

Commission Changed

At a recent meeting B. D. Marx was selected as executive officer of the California Fish and Game Commission and J. S. Hunter was appointed head of a new law enforcement department in entire charge of all the patrol force in the state.

CAMPING HINTS FREE

Tear out this ad, write your name and address on the margin and we will send you our new folder, *"Sleep in Camp."* Full of helpful suggestions on how to be comfortable in camp and to make your trips a real pleasure. We will also send you our catalog showing many Airubber conveniences and safety devices for home, camp, beach or boat. Draw a circle around one or more of these illustrations showing the sports of chief interest to you.

AIRUBBER CORPORATION
461 W. Superior St., Chicago

Simply Set the McNAB Rudder —and "Forget It"!

Why troll at impossible speeds when you can throttle down the motor and regulate *boat speeds* to meet most delicate requirements? *Simply set the McNAB and "Forget It."* Here's a new era of greater flexibility and boat control for fishermen, hunters and vacationists.

McNab Maneuvering Rudder

A sensation in marine engineering circles. The most revolutionary rudder development ever perfected. Stop boat in own length—just like "four wheel brakes"! Pivot on axis—go forward or astern without altering motor speed —motor *runs ahead* always!

WRITE AT ONCE for Free Literature, Prices, etc. Ask your Dealer or we'll ship anywhere in U.S. and Canada.

McNAB CORPORATION
Dept. 20 Yonkers, N. Y.

Barclay AUTO ICE BOX

Latest Motor Camping Necessity

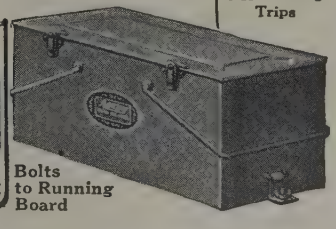
Keeps your food as clean and cold on tour as in the refrigerator at home. On your picnics or week-end trips you can enjoy crisp salads, firm butter, fresh fruits and cold drinks. On your fishing trips you can remove the ice container and fill the box itself with ice for packing your fish.
The BARCLAY fastens easily to the running board with thumb bolts or snap on the detachable handles and you have a refrigerator basket to carry inside the car. Weather, dust and rain proof. Holds ice full 24 hours. Spill-proof ice container is movable to let you pack provisions to the best advantage.
Ask for the BARCLAY at your dealer's or write us for descriptive folder fully illustrated.

BARCLAY MFG. CO.
1014 So. Council St., Muncie., Ind.

In your Auto Camp

On your Picnic Parties

For Fishing Trips

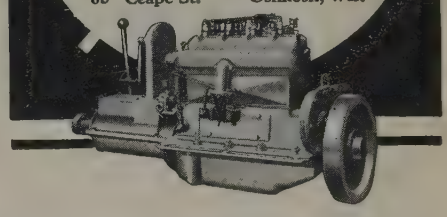


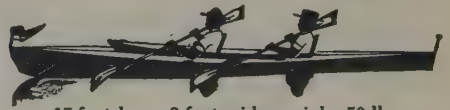
Bolts to Running Board

Universal Flexifour MARINE 10-15 MOTOR H.P.

YOU'LL wonder how such power and pep can be packed into so tidy a bundle! Flexifour is wonderfully compact—yet very accessible—easy to care for. New 1926 refinements, coming on the heels of its 1925 gain of 25% more power on 10% less fuel, make Flexifour HANDIER, simpler, smoother, surer to start and run. Get the facts and figures! Mention size of your craft.

UNIVERSAL MOTOR CO.
65 Ceape St. Oshkosh, Wis.





17 feet long, 3 feet wide, weighs 50 lbs.
Carries 800 lbs. Folding Canoe
Write for information
THE KAYAK MFG. CO.
Dept. N. 5556 Winthrop Ave., Chicago, Ill.

When our readers answer advertisements they help Nature Magazine

No. 17 No. 53 No. 50

BIRD HOUSES

Any Three For $5.00

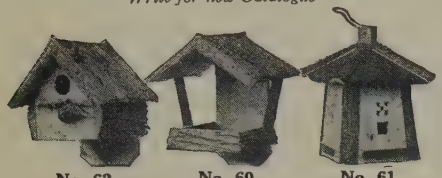
Rustic Houses do not require weathering but are ready for instant use. The birds like them because they are much like the hollow trees Birds nested in before it became necessary for man to provide Houses.

The Bird Houses appearing here in groups of three are interchangeable. Any three for $5.00 and Post charges. Weight of three, 10 lbs.

Your postmaster will tell you the correct amount to send.

Order by numbers.

Write for new Catalogue



No. 62 Bluebird No. 60 Robin No. 61 Wren

R.U.S.T.I.C. Cedar Bird Houses may cost more. Worth it.

CRESCENT CO., "Birdsville"

Toms River P. O., N. J.

Beautiful and Lasting Bird Homes

built to attract and protect birds and to be a joy to those who love our feathered friends.

—Free booklet on request—

ALFRED GAMBLE

537 Grove Street

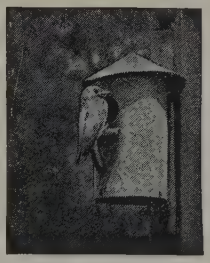
East Lansing, Michigan

Now Is the Time

To Put Up the PACKARD

Bird-Houses $1.00 Each

Why Pay More?



Used and endorsed by the Massachusetts Audubon Society for the Protection of Birds.

Featherweight, durable, ventilated, unobtrusive, easily cleaned, easily put up—and the birds love them.

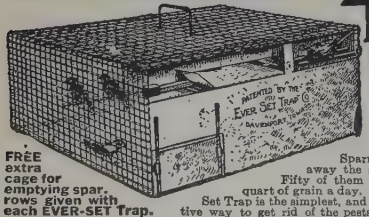
When ordering, add postage. Weight, packed, 1 house, 3 lbs.; 3 houses, 6 lbs. Parcel Post. *Everything for wild birds. Catalogue free.*

Address WINTHROP PACKARD

1433 Washington St. Canton, Mass.

Protect Song Birds

EVER-SET SPARROW TRAP— $4.50



Postage Extra

Zone	Cts.
1	.19
2	.19
3	.29
4	.48
5	.67
6	.86
7	1.06
8	1.25

FREE extra cage for emptying sparrows given with each EVER-SET Trap.

Sparrows drive away the song birds. Fifty of them will eat a quart of grain a day. An Ever-Set Trap is the simplest, and most effective way to get rid of the pests. Requires no setting; always ready. All galvanized—nothing to wear out—lasts indefinitely. Order today for quick delivery.

EVER-SET TRAP CO., Dept. 205

332 W. 2nd ST. DAVENPORT, IOWA

Exchange Foresters

There is much international goodwill and understanding born of the practice of exchange professorships and such an idea might well be applied to forestry and foresters. The suggestion is contained in an announcement from the United States Forest Service that four students among the first graduates of the forest school established by the Mexican Government are coming to the United States for forestry work. They will pay special attention to reforestation, silviculture, forest administration and forest utilization policies and methods and have been assigned to stations by the Forest Service.

A Nature Puzzle

By Louise R. Peattie

In this puzzle a word of ten letters is concealed, one letter hidden in each line, and the whole word suggested in the last couplet. For example, to take the first line, the letter "p" is in "sparrow" but not in "hawk." Now see if you can finish the enigma!

My first is in sparrow, but not in hawk,
My second in heron, but not in auk,
My third is in grouse, but not in quail,
My fourth's not in beak but it is in tail.
My fifth is in thrasher, as well as wren,
My sixth is in cock, but not in hen,
My seventh's in songster, but not in sing,
My eighth's not in fly, but it is in wing,
My ninth is in junco, but not in linnet,
My tenth is in pinefinch—twice it's in it.
My whole is a thing that by deeds and words
We should work to get for our friends the birds.

The answer to this puzzle will be printed in the June issue.

April Answer CONSERVATION

For Your Canary
Canary Junior Food Kit
Joyous companionship is insured when you give your canary KAEMPFER'S CANARY JUNIOR FOOD KIT. Contains 2 Kaempfer's Canary Highballs 1 package of Birdolene, the song food—1 Cuttlebone—1 Canary Call, and booklet "The Care and Treatment of Canaries". Mailed postpaid. Order today.
KAEMPFER'S
Dept. C-3,
30 E. Randolph St., Chicago, Ill.
56¢

BABY CHICKS FROM 200-EGG HENS

Chicks from winter laying, farm raised, mature stock S. C. W. Leghorns, R. I. Reds, Barred Rocks, White Orpingtons, Anconas, Black Jersey Giants, White Wyandottes, White Plymouth Rocks and Black Minorcas, Pekin and Indian Runner Ducks, $15 per 100 up. Live delivery guaranteed. Parcel Post prepaid. Hatching eggs, $8.00 per 100 up. Circular free. **Also have Belgian Hares, Flemish Giants and New Zealand Red Rabbits.**

GLEN ROCK NURSERY AND STOCK FARM

Ridgewood, New Jersey

Happy Wrens Will Come

to your garden or yard if you have these attractive homes.

They are just the right size, made from TUPELO GUMWOOD with broad protecting eaves. They are weatherproofed and painted deep moss green. Each has special wood strip for mounting to tree, pole or house. Protects wrens from annoyance by other birds. Sent post paid in U. S. A., east of Rockies.

3 for $1.00

(50 Cents Each)

Have several cheery wren families.—Send now.

WOODCRAFT SHOPS

212 Ellsworth Ave., S.W. Grand Rapids, Mich.

"WELCOME" BIRD HOMES

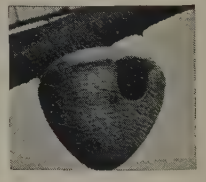
are unique, attractive to desirable birds, durable and inexpensive. For example, of those pictured, Nos. 1 and 2, $1.25 each; No. 3, $2.00 each, or all three for $4.25.

They Are Complete, Ready to Hang, and Sent Postpaid

FOSTER BROS., Ouray Bldg., Washington, D. C.

QUAINT QUARTERS

For Your Feathered Friends



A UNIQUE house, in which birds will build. Easily screwed to tree, arbor, or under eaves.

Artistic and unusual; weather-proof and squirrel-proof; indestructible—made of metal, painted a rustic gray. Diameter 6".

PRICES: *$2.00 each: $5.50 for 3. Including delivery by parcel post.* (*For Free delivery W. of Denver and in Canada add 10 per cent.*)

Supplied with 1" hole (for wrens) unless 1½" hole (for blue birds) is specified.

ROBERT C. REEVES CO., 184 Water St., N.Y.

Birds! Birds!

We can supply for immediate shipment all varieties of Pheasants, Wild Ducks, Geese, Swans, Cranes, Peafowl, Wild Turkeys, Canaries, Parrots and Cage Birds.

Ship Anywhere—Safe Arrival Guaranteed

TWIN BROOK GAME FARM

Box 44, Middletown, N. J.

ATTRACT DUCKS! FISH! GAME! AND BIRDS!

To your favorite haunts by planting the foods they love—*Wild Rice, Wild Celery*, Waterlilies and 35 other varieties—something suitable for every condition. Thirty years' practical experience. Questions gladly answered.

TERRELL'S AQUATIC FARM

6 N. BLK. Oshkosh, Wis.

A Business Proposition

Already several individuals have gone into the business of raising Christmas trees for the Yuletide market just as others raise pumpkins. They have found it a profitable way to put idle acres to work. In the light of this, the announcement from Alexander Macdonald, Conservation Commissioner of New York, that he has on hand a practically unlimited supply of young Norway spruce trees is exceedingly interesting. These are available to citizens of New York at a cost of two dollars per thousand for two-year-old trees. Properly handling along lines that will be suggested by the Conservation Commission on request, an annual business can be developed at a small cost. Mr. Macdonald can be addressed at the State House, Albany, New York.

Mr. Nut-Cracker "Dresses Up"

By H. Worstall

A new species of golden flecked squirrel has been discovered in a park near my home. His fur is the usual rust and gray shades, plus a generous sprinkling of bright yellow. The animal came by his odd coloring this way.

In the feed trays of the park deer was some fine, yellow meal. The squirrel, either too lazy or unable to locate the nuts stored in summer, decided to lunch on deer-food. This stuff was hard for him to manage, and he coughed and wheezed. He blinked his dusty eyes, disconsolately; but still kept trying to swallow. Usually, he choked. As the squirrel rooted in the powdery food, not minding how much he spilled, he came upon a buried kernel of corn, which he nibbled greedily. After that, he dug around like a mole, searching for further kernels—and finding them. The result was a new sort of rodent, gilded as if with star dust.

The deer did not seem to mind being robbed; in fact, they appeared not much interested in their food. As for the bespangled little robber—probably no one has ever seen a squirrel that would not eat.

A Tree Inventory

What are the natural assets of your community? That is a question that many of us cannot answer. We are more likely to know its population, rate of growth, volume of business, but how many of Nature's original gifts does the city or town still retain. This question Mrs. A. O. Cole, a leading club woman of Clinton,

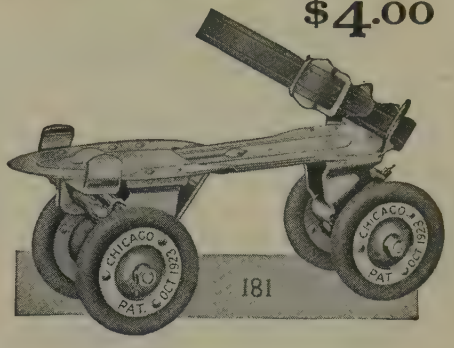
Traveling Some!

$4.00

Faster, smoother skating than you've ever known

ROLL ON RUBBER

CHICAGO Rubber Tired ROLLER SKATES



THEY'LL all think you've got winged feet when you race them on "Chicagos." Your friends may skate as well as you can, but they won't beat you on a pair of these speedy, noiseless, ball-bearing skates with real **rubber tires.**
Spring is here! Clear sidewalks! Balmy air! Sunny skies! It's time to roller skate—have you got your "CHICAGOS" yet?

At your Hardware or Sporting Goods Dealer, or shipped direct for $4.00 P. O. Money Order

CHICAGO ROLLER SKATE CO.
4451 W. Lake Street **CHICAGO**

RUSTIC HICKORY—NATURE'S KIN

Nothing can take the place of the forests or the streams or the flowers. The lone pine standing against a clearing sky has no fear of substitution or imitation.

But Rustic Hickory Furniture is the nearest thing to Nature that man ever made, because it is constructed of natural selected second-growth hickory poles, with the bark left on. Only the rough edges are smoothed off.

Rustic Hickory Furniture blends perfectly with the natural surroundings of any summer home, camp or lodge—indoors or out. The woods and waters are its brothers—it is Nature's Kin.

Many hundreds of outdoor lovers have found the real satisfaction that comes with the ownership of Rustic Hickory. Not only does it look good, but it will last a lifetime, and no less a person than the late Elbert Hubbard eulogized its extreme comfort.

A treat for your eyes is awaiting you between the covers of our beautiful new catalog, a copy of which will be gladly sent you on request. Ask for Catalog D.

RUSTIC HICKORY FURNITURE COMPANY, La Porte, Ind.

Unfold your boat and Shove Off

Put your boat in your car or carry it under your arm. When you get to the water unfold it, and in six to eight minutes you are ready to shove off. That's what you can do when you own an ACME Folding Boat or Canoe. It will do anything a wooden boat will do—and more. It is lighter, easier to handle, and safe. It won't snag, tear, or leak. It is rugged, strong, and will stand rough usage. It will carry enormous loads. And the price is surprisingly low.

Thirty-six Years' Experience Making This Boat. Sold All Over The World
A more convenient boat is not made. Mail the coupon and get all the facts about it. Let us tell you how it is built. What its thousands of users think of it. Why it is just the boat you want for your fishing, hunting and outing trips. Mail the coupon **today.**

THE ACME FOLDING BOAT COMPANY,
511 Boat Street, Miamisburg, Ohio.

THE ACME FOLDING BOAT CO.,
511 Boat Street, Miamisburg, Ohio.
By return mail, please send me, without any obligation, full details of your Acme Folding Boats and Canoes.
Name .....
Address .....

Remarkable Light Weight Binocular Opens New Realms of Enjoyment

At Last! A super-power binocular with perfect, clear-cut, unblurred vision. After 55 years in the optical business, we offer the new Hawksight, a full 8-power, prism binocular so light in weight a child can hold it steady.

In obtaining super-vision and lightest weight, the rugged strength of the Hawksight has not been sacrificed. We give absolute guarantee, backed by over a half century's reputation for honorable dealing, to replace at *any time* any Super-Power Hawksight which does not give satisfactory service. This guarantee applies except against accident or abuse.

Throughout, you will find the Hawksight a remarkable glass. The extra fine achromatic prisms are made for us in France. The image is shown clearly in its exact colors without any aberration or rainbow-like effect. Illumination is so superior, exceptional definition is obtained even in poor light. You will be astonished with the Hawksight at night! The field is a full 119 yards, at 1000 yards distance. Accurately adjustable to vision of each eye by means of the central focusing device and also adjustable to pupillary distance between eyes. Entirely dust proof. Beautifully finished. Every glass stamped with our name and its serial number. Case is sole leather, plush lined, to fully protect glass. *Entire* weight of Hawksight (8-power, 27 mm.) and leather shoulder straps, only 25 ounces.

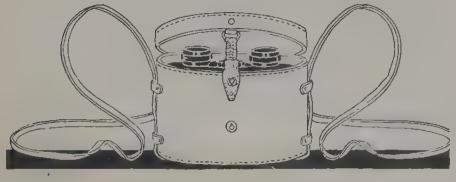
Try it in rough weather on deck, use it while in motion in a motor car; look through it during an entire afternoon of racing; give it the most severe tests. It easily keeps steady aim at the object. The glass becomes a part of your own vision, as objects are quickly brought within easy range.

It is a wonderful chum for a quiet day in the woods or for an exciting day at the races. For hunters, campers, travelers, nature lovers and outdoor devotees, it is the ideal glass—a superb binocular for land or sea; for discovering new vistas in foreign lands or revealing new beauties, new sights, new worlds, right from your own window or veranda.

The new Super-Power Hawksight is specially priced at $24.85, all carrying charges paid, with privilege of two weeks' *free examination.* If not completely satisfied at the end of trial period, that Hawksight is without exception the finest binocular you have ever seen at anywhere near its price, return at our expense and your money will be refunded. Send check or money order without any obligation to keep glass after trial, and the Super-Power Hawksight will be shipped by return mail.

A.K.HAWKES CO.

33-U Whitehall St. (*Opticians*) Atlanta, Ga.



Iowa, asked herself. She mobilized the Nature section of the club and the community itself to take an inventory of the trees of Clinton. She emphasized the need of discovering whether the years had shown a loss or a gain. She pointed to the importance of trees in attracting birds which in turn feed upon the injurious insects. Reports came in showing a wide variety of trees and the work is still going on when this is written. Another aim of the Nature lovers of Clinton is a town forest of nut trees and a bird sanctuary.

Geyser in Action

Giant Geyser in the Yellowstone National Park commemorated the birthday of Abraham Lincoln by playing for the first time in three months, Charles Phillips, Ranger at the Old Faithful Station, reports in the Yellowstone Nature Notes. Both this and the last previous eruption took place at night. The heavy pole which is kept across the cone to indicate any unobserved activity was hurled away and many fragments of sticks and poles came up with the eruption. These sticks bore evidence of severe laundering and most of them came there as a result of investigations by tourists, who are wont to poke a curious stick into the cone and race away and leave it when the geyser answers with boiling water.

Antelope Increase

California antelope are on the increase, thanks to the rigid protection thrown about that animal by the laws of the state, according to Dr. H. C. Bryant, head of the Bureau of Research and Education of the California State Fish & Game Commission. Dr. Bryant recently returned from an extended trip throughout the northeastern counties of the state, bringing the news that in Modoc and Lassen counties antelope herds have shown remarkable increases in recent years. One of the herds seen by Dr. Bryant during his trip contained 22 animals. But a few years ago this herd consisted of but eight animals. Residents of that section declare having seen several small herds drifting into Secret Valley, the favorite wintering ground of the wild game of that region, early this fall.

THIS CLEAR, POWERFUL 6 POWER VEST POCKET
TELESCOPE
with glove leather case $2
Only 3¾ in. Postpaid

ong! Easily slips in vest pocket, yet powerful, precise, adjustable to either eye, six full magnifications, and brings distant objects close without objectionable "trembling" of higher power glasses. Nothing cheap in appearance or action. Guaranteed satisfactory by us and by maker, or money back at once. Handsome black baked-in enamel finish. Fine flint glass lenses by Wollansak. Check, money order or C.O.D. $2.00 prepaid, including fine limp leather case.

BOSTON SPORTING GOODS CO. 1035 Little Bldg. BOSTON, MASS.

BUY AT WHOLESALE!

Save ⅓ to ½!
"Marchand"
Full Acromatic
Ocular Lenses
$6.75

A rare value for the sport and nature lovers! A limited number of brand new genuine "Marchand" Bird Glasses at an enormous reduction in price. 19 ligne or 1¾-inch diameter objective lenses and big ocular eyepieces. Extreme brilliancy of illumination, large field and sharp definition. Magnify 4 times. No color aberrations. Guaranteed brand new and perfect. Size closed 3½ in., extended 5 in. Complete with case, cord and shoulder strap. Sold regularly, everywhere, at $15.00 and up. Special sale price now, $6.75.

SEND NO MONEY

We'll send these genuine "Marchand" Bird Glasses on this liberal trial offer. Order by letter or postcard, now. Send no money. When glasses arrive, pay postman only $6.75 plus postage. Then put these glasses to every test you know of. Take them with you on your pleasure trips. Compare them for efficiency, value and price with those your friends have or those YOU can buy ANYWHERE else. After 10 days' trial, if you are not delighted with your purchase, send the glasses back and we'll refund every cent you paid. No risk to you. Send your order today while this special offer lasts.

Free catalog showing hundreds of other models, all sold direct by mail at big savings. Send for it today—no obligation.

NEW ERA OPTICAL CO., DEPT. 1456, 17 NO. WABASH AVE., CHICAGO, ILL.

BINOCULARS

All Prices
All Makes

TEN-DAY TRIAL
MONEY-BACK
GUARANTEE

You buy Binoculars once—*get the one pair best suited to your needs.* Our comprehensive catalog shows you Binoculars for all needs at all prices. All guaranteed. Ten-Day Trial allowed on any pair you select. We carry no army or job lot glasses. Our 43 years of experience give you reliable Binocular information. Before you spend one cent, get this Binocular Book! Then, and only then, can you determine what type of glass you should buy. Write today.

Mail this for the CATALOG BINOCULARS OPTICAL GOODS

WATRY & HEIDKAMP, Dept. 5-E
17 W. Randolph St., Chicago
Please send your comprehensive catalog to

Name .....
Address .....
City ..... *State* .....

Big 3-ft. Telescope

Makes people and objects miles away seem close. Brings new pleasures to home, farm, camp, travel, sport. See moon and stars as never before. New Ferry "Wonder" telescope has 5 sections — over 3 ft. long open, 12 in. closed. Fully brass bound. Powerful lenses.

Only $1.85

5 Sections
8-Power Lenses
Thousands Delighted!

FREE!

Yes, Absolutely FREE! Handsome leatherette covered Carrying Case, light, strong, complete with strap. Handy for farmers, auto tourists and hikers.

"I am delighted with the 'Wonder' telescope. Today I have been watching submarines 3 miles off the coast." —Philip Brush. "I can see across the Mississippi 3 miles and see people fishing."—M. L. Thorn. "I am nearly 80 years old and if I could not get another would not take $10.00 for it."—A. R. Walker. "I can tell time on the church clock 5 miles away."—Edward Foster. "Could tell color of aeroplane 4 miles away."—Mrs. L. M. Yarbrough. "I saw a Light House 18 miles away."—Clyde Scribner.

SendNoMoney

Send name and address and Ferry Wonder 3-ft. Telescope with free Carrying Case will come by return mail. Pay postman special bargain price of $1.85 plus few cents postage. Satisfaction guaranteed or your money back. Supply limited, order today!

Ferry & Co., Dept. 1455, Chicago

Trees for the Home

Where it is not possible to build the new house on a lot having good trees the first step toward an attractive home is tree planting. Even with trees already established, plants of smaller growth are required in addition if a home atmosphere is to radiate from the house. A proper combination of these gives the most pleasing result.

Locating the walk and the drive, if there is to be one, is a necessary preliminary to planting the grounds. The less conspicuous they are the better for the general effect. If the house is close to the street a straight walk is the least obtrusive and cuts up the lawn less than a curving one; but if the house is farther from the street than the width of its own front an unbroken lawn may be provided by curving the walk from one corner or the other. When a drive is needed it may often be used as a substitute for a walk. Walks and drives should be kept as few in number and as limited in area as conditions will permit.

Proper location of shade trees is probably the most vital of all the planting details. Where the house is placed close to the street the street trees are usually the only ornamental trees that can be used, but where there is room some are needed near each corner of the house as a frame but none in front to obstruct the view. On a large lot additional trees provide welcome shade but must not obstruct the picture of the front.

Shrubs planted in irregular clumps along the foundation give the house the appearance of nestling against the earth instead of protruding from it. This effect is heightened by having portions of the foundation showing so that the house has the appearance of stability instead of resting on foliage as would be the impression if none of the foundation line were visible. Irregularity of top or sky line is obtained by planting tall plants at the corners or in broad spaces of walls between windows while lower plants may be used beneath windows or at the porch.

Groups of woody plants may be located at various points on the boundary of the lawns and especially at the corners and near the entrances of walks and drives, but they must not be high enough to hide approaching traffic. Other uses for plantings on the home grounds are as screens for work yards, private areas, or objectionable views, as well as to form a partial enclosure for the flower garden. Plants of suitable height for the different locations should be selected, using lower kinds in front. Variety may be secured in habit of growth, in size, and color of foliage. It is well to select the flowering plants used so that blooms come at different times, prolonging the season of interest. Some kinds have the added attraction of showy fruits or of bright colored stems which may be utilized for increasing the interest in the plantings. Evergreens, both deciduous and broadleaf, have advantages for winter effect.

"Beautifying the Farmstead," Farmers' Bulletin 1087 of the United States Department of Agriculture, discusses the principles of landscape development, applicable alike to the farm and to the town home.

2 Generations of Honorable Dealings
SEAVER WILLIAMS
BOSTON MASS.

Spot Game Miles Away!
with these POWERFUL imported
BINOCULARS
8-POWER

CONQUER Distance. Follow flight of fowl high in sky! Observe movements of deer, bear, birds, ships, people off in the distance. Autos roaring 'round the track! Horses tearing down the turf! Make your eyes **8 times stronger!** Bring objects *right to your feet!* Keep a pair in your car! Motoring will become a joy! When off for a hike sling a pair over your shoulder (*they add that smart military air*) and enjoy glorious vistas—as never before. These Binoculars will prove a never-ending lifetime joy! Indispensable for camping, hunting, hiking, yachting, races, motoring, shut-ins, observation, bird and nature studies, etc.

Hundreds Supplied to Army and Navy Officers

A LIMITED importation received! French and German Army Officers' 8-POWER Prism Binoculars; famous PREMIERE QUALITE'; brand new, *perfect*. Brilliant illumination, exquisite definition; remarkable light-gathering power. Wide field of vision—many times area of field glasses. Central focusing with individual eye-strength and width adjustments. Superbly constructed, handsomely finished rich grain leather. Heat and moisture proof. Usually sell for $40.00 to $50.00. **Our Price** (*while limited quantity lasts*) complete with leather case, neck and shoulder straps $23.50

Our Plan is Different!

Send NO money! Pay NOTHING to postman. See, Try, Test. Use Binoculars for **10 Days' Trial Absolutely Free!**

10 Days FREE! Send NO MONEY! Pay Nothing to Postman

WE ask only privilege of sending BINOCULARS on 10 DAYS' FREE TRIAL. (*We have confidence in our goods!*). If you're pleased with BINOCULARS, you may pay on Budget Plan:—

$5.00 MONTHLY

or, if you wish to pay cash at end of 10 DAYS, deduct $1.75 and send Check or Money Order for $21.75 in FULL SETTLEMENT $21.75

SEAVER-WILLIAMS CO.
Optical Goods Division
Importers, Exporters, National Mail Order House
365 Washington Street, Boston, Mass.
Largest Distributors of Binoculars in the U. S.

Gentlemen: — Send me the 8-Power Binoculars, $23.50, for 10 Days' FREE Trial. If pleased, within 10 days I have the privilege of paying $5.00 monthly or of deducting $1.75 and sending $21.75 in full settlement. Otherwise I shall return them.

NAME .....

ADDRESS .....

Tear out and mail this coupon NOW! If you wish to tell us something about yourself, it will be appreciated—simply write on separate slip of paper. Nat. 5-26

Send NO Money
Mail Coupon Only!
Limited Quantity
ORDER *NOW!*

Tip of Fly's Leg as seen thru Ultralens

A $50.00 Microscope
will do no more than this remarkable instrument for 7.50!

ULTRALENS

At last the high powered microscope is within the reach of all who wish to study, observe and experiment with the vast world of minute objects that are invisible to the naked eye. A remarkable discovery enables us to manufacture the Ultralens Microscope (magnifies 225 diameters) for **one-eighth the usual cost.**

EASY TO USE

Any Amateur can immediately start using his Ultralens for the examination of hundreds of objects, which become startlingly odd or beautiful under its powerful lens. No technical training required, yet hundreds of scientists and teachers are using this instrument today. It is at once interesting, instructive and scientific. Gives enormous magnification and perfect definition.

COMPACT

The Ultralens Microscope comes packed in a beautiful Leatherette case with full instructions that any one who can read can understand. Lenses of 125 x and 325 x objectives can be furnished at $1.50 each.

ORDER TODAY

Order direct from this advertisement and get your Ultralens Microscope now. Fully guaranteed. If, however, you desire more information before purchasing we will gladly send free descriptive catalog.

$7.50 *Complete Outfit Prepaid*

Scientific Apparatus Corp.
Dept. 205 Milton, Pa.

OCEAN CITY, N. J.
10 MILES SOUTH of ATLANTIC CITY
AMERICA'S GREATEST FAMILY RESORT
THE FLANDERS
BOARDWALK AT ELEVENTH STREET
AMERICAN PLAN
NEW-MODERN
FIREPROOF
232 ROOMS WITH BATH
SEA WATER BATHS
AND OPEN-AIR
SWIMMING POOL
J. HOWARD SLOCUM
PRESIDENT-MANAGER
FOR SEVEN YEARS MANAGER
"The GREENBRIER"
WHITE SULPHUR SPRINGS
West Virginia

WANT WORK AT HOME?
Earn $18 to $60 a week RETOUCHING photos
Men or Women. No selling or canvassing. We
teach you, guarantee employment and furnish
WORKING OUTFIT FREE. Limited offer.
Write today. ARTCRAFT STUDIOS
Dept. C. 3900 Sheridan Road, Chicago

Rider Agents Wanted
Select from 44 Styles, colors and sizes of Ranger Bicycles. Ride, exhibit and make money. Delivered free, *express paid*, on approval. Bicycles $21.50, up.
$5 a Month on any Ranger if desired. Write for marvelous prices and Time Payment terms.
Tires Lamps, horns, wheels, parts, equipment, and repairs at half usual price. Save $10 to $25 on your bicycle.
Mead CYCLE COMPANY DEPT. A-144 CHICAGO Write to us today

SEND US YOUR FILMS
We develop, print, enlarge. Careful attention to details that make superior quality pictures. Rolls developed 9c, prints 3c each, trial 6x8 enlargement in folder 40c.
Wellington Photo Services
RIVERDALE, MD.

ENLARGEMENTS
Introductory Offer, this month only; send negative & 30c for a 5x7 enlargement. New bargain list FREE. Mail your films; we give overnight service.
ROANOKE PHOTO FINISHING CO.
7-B Bell Ave. Roanoke, Va.

Save your copies of
NATURE MAGAZINE
Let the Nature Binder help you to do this
The Nature Binder is a rare treat for the true book lover. It has been designed to hold one volume (six copies) of NATURE MAGAZINE. The insertion of a small aluminum strip in each copy which in turn is fastened on to two brass posts, BINDS the edges of the magazine securely, giving it the appearance of a book whether open or closed.
Price, $1.00
NATURE BINDER DEPARTMENT
American Nature Association Washington, D. C.

Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: *I am interested in learning the range of flying squirrels in the United States. I live in North Jersey and have only seen one of them here.*—C. S.

ANSWER: Flying squirrels of some sort are found over the greater part of the United States excepting the treeless portions. There are two species, a larger northern and mountain one, and a smaller southern one. These overlap in southern New England and New York, so that in some places there are two species. In New Jersey, however, you have only the smaller kind.

QUESTION: *Is it true that bullfrogs sometimes eat sparrows and other small birds?*—T. E. P.

ANSWER: The bullfrog is a voracious species, and in the gulf region reaches a much larger size than in our northern states. We have read of instances of bullfrogs capturing small birds, and have no doubt that sometimes this happens.

QUESTION: *I have read that wolves, unlike dogs, have webbed feet, but I have never seen any evidence of this. Is there anything in it?*—D. E.

ANSWER: The feet of wolves differ in no essential respect from those of dogs, and the tracks of the two animals in almost all cases are so nearly alike that they cannot be distinguished except by an expert.

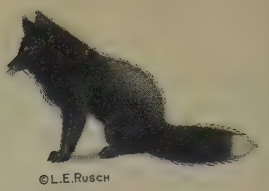
QUESTION: *What is the smallest deer in the world, where does it live, and what is its shoulder height?*—J. P., Jr.

ANSWER: The smallest deer is *Tragulus javanicus*, one of the so-called mouse deer from Malay. The height at the shoulder is only about twelve inches.

QUESTION: *How do snakes incubate their eggs; feed and protect their young?*—G. W. R.

ANSWER: The egg-laying snakes usually deposit their eggs in decaying vegetation and leave them to hatch. The rattlesnakes, copperhead and water moccasin, as well as the common water snake and some others, retain the eggs in the body until they hatch, so that the young are born alive. These may protect their young for a short time, but the egg-laying snakes pay no attention to them.

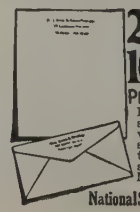
QUESTION: *Will you please tell me if a frog shows a red flag or bag or something at his throat at times or is it confined to a lizard entirely? A frog sticks out his*

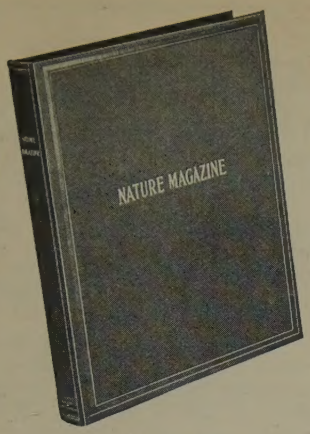
LEARN SCIENTIFIC FOX RAISING

©L.E.Rusch
The SILVER BLACK FOX INDUSTRY needs intelligent, ambitious men as superintendents and caretakers. Good salary, unlimited opportunity, healthful occupation. Necessary instruction and practical experience is offered by independent, nonselling, nonprofit School. Special intensive course two months, beginning June 14, held at big, scientifically managed fox ranch. Write for booklet.
Rusch School of Fox Breeding
760 Investment Building
Washington, D. C.

Artistic Mountings
Why not have your specimens mounted by master craftsmen who have devoted their lives with love and enthusiasm to the art of taxidermy? Our beautiful catalog, richly il'ustrated, will show you why Jonas Bros. work has become internationally known. Write for it today—FREE.
JONAS BROS.
1023 Broadway Denver, Colo.

Make Money in Photography!
We train you quickly at home. No experience necessary. Spare time or full time. Photographs in big demand by magazines, newspapers, advertisers, etc. Portrait Photographers make more money today than ever before. Commercial Photography also pays big money. New Plan. Nothing else like it. Write today for details and new FREE book, "Opportunities in Modern Photography."
International Studios, Inc.
Dept. 1675 3601 Michigan Ave., Chicago, Ill.

YOU CAN OIL PAINT
TALENT NOT REQUIRED—ANYONE CAN LEARN.
It's amazing how quickly our new method enables men and women to actually oil paint with ease and professional skill—even after the first lesson. Nothing difficult or tiresome to master. You begin to oil paint photos, animals, birds, landscapes or any art subject at once and earn real money. One student writes she earned the entire cost of the course in less than a week after completing the second lesson. You can do it, too. Our business methods show you how.
EARN $18.00 TO $50.00 OR MORE A WEEK AT HOME
Demand for color art work is growing daily. Graduates everywhere tell us they are unable to keep up with orders. Learn more about this fascinating profession. Ask for our free illustrated booklet. It tells all about the course and free working outfit. Remember, no talent is required. *You*, too, can learn. So write today.
Pictorial Art Studios, 2731 N. Clark St., Dept. E. N., Chicago


200 Sheets 100 Envelopes $1.00 POST PAID
PRINTED WITH ANY NAME AND ADDRESS
High grade, clear, white bond paper—unusually smooth writing surface. Size 6x7 inches with envelopes to match. Name and address on every sheet and envelope in rich dark blue, Plate Gothic type, up to 4 lines. Send $1.00 (west of Denver and outside the U.S. $1.10). We prepay postage. Money returned if not satisfied. Order today.
National Stationery Co. A145 Lincoln Highway, Batavia, Illinois



MAKE

Beautiful Books

OUT OF YOUR

Nature Magazines

You can buy for $1.00 an attractive green binder, just like the cover of a book, which will hold one volume — six copies—of NATURE MAGAZINE. There is no better way to preserve NATURE MAGAZINE, to keep each issue clean, neat and intact; to have it on hand to show your friends, and to keep the different issues together, than to use one of the NATURE MAGAZINE Binders.

Price Only $1.00

Mail This Coupon

NATURE MAGAZINE,
WASHINGTON, D. C.

I enclose $1.00. Send me a NATURE MAGAZINE Binder.

Name.....

.....

.....

tongue to catch flies or insects, but is there any color like the flag of a lizard?—E. K.

ANSWER: Some of the tropical species of frogs have yellow throats, and our own southern green marsh frog (*Hyla cinerea*) has a yellowish throat in the male. We cannot find, however, that any frogs have red throats, excepting, of course, certain small central American species which are mainly bright red all over. In those of our frogs in which the male when singing inflates the throat, that part has usually a thickened brownish or yellowish skin, but we know of none in which it is any conspicuously bright color.

QUESTION: *Why does frost appear on low land before it does on high land when the latter is always colder?*—T. C.

ANSWER: The relation of frost to local differences in altitude is a very complex matter. In general, however, the tendency of killing frosts to occur first in low ground is owing to the settling of the cold air. This is particularly true of small valleys more or less inclosed by woods or steep hills, which convert them into pockets. A free circulation of air tends to prevent frosts, and this sometimes explains their absence in high ground where there may be a light breeze.

QUESTION: *We have heard that ladybugs eat woolens. Is this true?*—J. R. W.

ANSWER: Lady bird beetles (excepting one large, orange, black-spotted one, which feeds on the leaves of squashes, etc.), are predaceous, feeding on other insects such as plant lice and scale insects. None eats woolens. They are, therefore, with the exception noted above, beneficial.

QUESTION: *Can you tell me whether fish can hear, and if so, how?*—W. B.

ANSWER: Fishes have no external ears, as do most vertebrates, but most species have organs which receive and transmit to the brain the impressions of sound, and in some cases are only covered by a very thin membrane or a thin bony plate. They have no tympanum, or ear drum, nor tympanic cavity.

Audubon Bird Charts

Interesting - Instructive

Awaken the interest of children in our common birds with these charts depicting the natural colored, life-sized birds in their characteristic attitudes. They are practical and helpful in all nature study and drawing.

Lithographed and mounted on cloth. Size 27 x 42 inches

For

Home Schoolroom Library

Four Beautiful Charts

Price $2.50 Each

AMERICAN NATURE ASSOCIATION
1214 Sixteenth Street
Washington, D. C.

AMERICAN NATURE ASSOCIATION,
1214 Sixteenth St. N.W.,
Washington, D. C.

I desire membership in the American Nature Association, including NATURE MAGAZINE each month, and such bulletins and information as are given to members. I will remit $3.00 for one year's dues upon receipt of your bill.

90% of the annual dues is designated for subscription to the magazine

Name.....

Street.....

City.....

May

AMERICAN NATURE ASSOCIATION,
1214 Sixteenth St. N.W.,
Washington, D. C.

I enclose $3.00 for membership in the American Nature Association for one year, including NATURE MAGAZINE each month, and such bulletins and information as are given to members.

90% of the annual dues is designated for subscription to the magazine

Name.....

Street.....

City.....

May

AGAIN THE TREE PLANTER LOOKS AHEAD

THE TREE PLANTER is an optimist and the world needs more of both. The tree planter must of necessity look ahead. He is a person of vision, for those who come after him reap the full benefit of what he plants. But in the meantime he has set a good example. In the tree we find one of Nature's greatest lessons and her greatest gift to man. The growing of a tree is a slow process as man counts the span of life, and that is all the more reason for planting now.

* * *

New thousands join the ranks of the tree-planting army every year. During this year thousands of semi-centennial trees are being planted to mark 1926, the half century year since the United States Government made the first step in forestry investigation. What will these trees be like in 1976? Perhaps a comparative few of the tree planters will see the fine results of their efforts, but the trees will be there to carry on the message of optimism which the tree planter planted with the seeds of his tree.

* * *

The American Tree Association is now getting the first returns from the many thousands who will plant trees this year. These returns came from the Sacramento schools, where Florence G. Billig has enlisted a thousand tree planters on the honor roll of the American Tree Association at Washington. In Georgia, Mrs. Don T. Barnes continues her tree-planting drive through the Women's Clubs. It so happens that the State of Colorado is celebrating a semi-centennial this year, too. Through the Colorado Forestry Association and Chambers of Commerce thousands of semi-centennial trees are being planted in that state. The Chambers of Commerce got behind the campaign in a big way and offered prizes for the units doing the best work.

* * *

To go back still further in history, Montgomery County, Maryland, has the honor of being the first county on the North American continent to be named for a native-born American. A plan is now under way to plant a memorial road in honor of this soldier of the Revolution.

* * *

The tree plantings take many forms and phases—one of which is town forests. This community endeavor is being taken up in many new places throughout the country. More than a hundred thousand trees have been set out at Palos Verdes, California. At Scituate, Mass., a big reforestation project by the town is under way. At Seattle, a city-beautiful campaign backed by 25 organizations has just been launched.

* * *

One of the phases of tree planting is the memorial project which has been taken up throughout the land. First, it was the memorial tree, then the memorial row, the memorial avenue and the Road of Remembrance, as well as the memorial grove. In all these endeavors the community joins.

* * *

Landowners along Connecticut state highways have been asked by the state to cooperate in the plan to beautify the trunk-line system with trees and shrubbery. Hans A. Bauer, of New Haven, a graduate of Yale Forestry School, has been selected by Highway Commissioner John A. Macdonald to supervise the beautification of roads, which was authorized by the legislature. One of the first routes to be acted upon will be the Boston Post road, running from Port Chester, N. Y., along Long Island Sound through Bridgeport to New Haven.

* * *

At Houston, Texas, there is a memorial tree planting each year in honor of Norma Meldrum, whose parents gave a children's library to that city. The Waco Academy planted memorial trees for George Washington.

* * *

In appreciation for her long and faithful service as teacher in grammar schools of Tuolumne County, a tree was planted on the Sonora school grounds for Mrs. Adelaide Miller. The ceremonies were under the auspices of the Welfare Club and were opened by Mrs. Matilda C. Hender, who was one of the pupils of the beloved instructor many years ago. Other speakers were Mrs. F. W. Leighton, president of the Welfare Club; C. H. Burden, lifelong friend of the teacher, and George F. Creary, principal of the Grammar School. The first spadeful of earth was placed about the tree by Mrs. Miller.

* * *

The American Legion, the D. A. R., and the Parent-teacher Associations are leading organizations actively urging memorial tree planting. The Izaak Walton League is pushing three planting through all its local officers. This organization is particularly interested in the town forest project. At Attica, Ind., the Ouibache Chapter of the D. A. R. has planted one hundred tulip trees, the official state tree of Indiana. Every member of the Chapter is represented by a tree.

* * *

Thousands of memorial trees have been planted by American Legion posts. One of the biggest programs just completed was that of the Henry Cretton Post of Niagara, Wis., where five hundred joined the tree-planting army. The Legion has also taken up the memorial town forest idea in hundreds of places, since Commander D'Olier issued the first tree-planting order when he was head of the Legion. The fine thing about the Legion's program is that memorial trees are being planted for the man who offered his life to his country as well as the man who gave his life to his country.

* * *

In the "Grove of States on Riverside Drive" there has just been planted a memorial tree in honor of Peter Minuit, who landed on Manhattan Island three hundred years ago. The ceremony was directed by Mrs. John Clapperton Kerr of the Women's League for the Protection of Riverside Park. The dedication of the "Grove of States" was marked by this tree planting.

* * *

The District of Columbia Federation of Women's Clubs planted 360 trees on the Bladensburg Road on Arbor Day. This memorial row of trees was dedicated to the memory of women both in and out of the organization. The trees were registered on the honor roll of the American Tree Association.

* * *

A good tree-planting lesson was found in one of the newest members of the tree-planting army but one of the oldest tree planters, Col. S. G. Mason, also of Iowa, who writes: "In the spring of 1860, when I was 15 years old, I gathered one-half bushel of soft maple seed on the Cedar River and planted them on my father's farm, southwest of Independence. In 1867 we set out five acres eight feet apart. For over fifty years two families have had all the firewood they needed, and I believe there is enough left for forty more years. Besides this we cut poles for fences and trees for many other purposes, and without a doubt sold one hundred and fifty to two hundred hay poles forty to forty-five feet long. The grove has for many years averaged over one hundred feet high, and I am foolish enough today to believe I have the finest artificial grove in the state of Iowa. It is the easiest thing in the world to reforest this country, especially as far as the farmers' interests are concerned. I am a traveling salesman and am starting today on my fifty-ninth year on the road."

* * *

So it is there are many reasons for planting trees.

* * *

The peak of the spring tree planting was during American Forest Week, when every school in the land was reached with the forestry message by the Forestry Primer published by the American Tree Association to mark the semi-centennial date. So great was the demand for this booklet that Charles Lathrop Pack, the president of the Association, ordered a third edition of one hundred thousand copies. Truly the tree planter is an optimist. He looks ahead. Join the ranks by sending to the American Tree Association for free tree-planting instruction and application blanks. The tree planter of tomorrow will profit by the example of the tree planter of today.

Forestry Primers for Our Readers

The new edition of the Forestry Primer is now ready for distribution. Every member of the American Nature Association can have a copy by sending to the Editor, NATURE MAGAZINE, Washington, D. C., for it. This service to our readers is arranged with the American Tree Association which has published the Forestry Primer to mark 1926, the semi-centennial of the first step in forestry by the United States Government. Every member of the American Nature Association should be informed as to the forestry situation set forth in the Forestry Primer.

John Davey's great contribution to America

JOHN DAVEY, Father of Tree Surgery, "*Do it right or not at all*"

ohn Davey was born in England, June 6, 346, at a time when there were no public hools. This hardy and humble genius as twenty-one before he knew his A B C's. o he started in as a full grown young man o learn to read by the slow and painful rocess of self-education. He began with a ttle copy of the New Testament and a nall dictionary, picking out one word at a me. Later he acquired a grammar so that e might put the words together properly, eanwhile studying horticulture and landcape gardening during a full apprenticehip at Torquay, England.

Then he heard the call of America, this reat land of freedom and opportunity; nd, like millions of other sturdy sons of urope, he came here to work out his desiny. He pursued his education still furher, working by day and studying by ight, until he acquired an education that vould do credit to the majority of college raduates.

Perhaps one of the most striking things bout him was the fact that he became one of the finest Americans. He learned every word of our Constitution. He learned every word of every verse of America and the Star Spangled Banner; and, until old age aid its heavy hand upon him, he could ing those songs with a zeal and a fervor hat was good to see.

He became a full citizen at the first opportunity under our law, and to him it was a sacred day when he raised his right hand and forswore allegiance to the British crown and swore allegiance to the Constitution and the flag of America. And always, during his fifty years in his adopted country whenever he passed by Old Glory, he would tip his hat in veneration.

John Davey saw with eyes of understanding and sympathy the appalling neglect and butchery of America's trees, and he set out to find a way—a systematic, scientific way—to save them, little dreaming that a great business would be developed on the science that his love and genius created. And thus came into being the wonderful profession of Tree Surgery.

His first book, The Tree Doctor, was published in 1901, and then began the gradual development of The Davey Tree Expert Company, incorporated in 1909, doing a business of nearly $2,000,000 in 1925, and now having in the field nearly 700 master Tree Surgeons, all carefully selected, thoroughly trained, properly disciplined, and regularly supervised, and giving superior service to the tree owners of America. For twenty years the business of this institution has been managed by his son, Martin L. Davey, whose highest aim has been to perpetuate the ideals and philosophy of his pioneer father.

John Davey, though not now living, still lives in the spirit and purpose of the magnificent service that he rendered his adopted country—he taught the American people to think in terms of the living tree. Greater even than his creation of the invaluable science of Tree Surgery is his contribution as the apostle of the tree as a living thing.

THE DAVEY TREE EXPERT CO., INC., 607 CITY BANK BLDG., KENT, OHIO

Branch offices with telephones: New York, 501 Fifth Ave., phone: Murray Hill 1629; Albany, City Savings Bank Bldg.; Boston, Massachusetts Trust Bldg.; Philadelphia, Land Title Bldg.; Baltimore, American Bldg.; Washington, Investment Bldg.; Pittsburgh, 331 Fourth Ave.; Buffalo, 110 Franklin St.; Cleveland, Hippodrome Bldg.; Detroit, General Motors Bldg.; Cincinnati, Mercantile Library Bldg.; Indianapolis, Fletcher Savings and Trust Bldg.; Chicago, Westminster Bldg.; St. Louis, Arcade Bldg.; Kansas City, Scarritt Bldg.; Minneapolis, Andrus Bldg.; Montreal, Insurance Exchange Bldg.

DAVEY TREE SURGEONS

Live and work in your vicinity—quickly available, within easy motoring distance—no carfare charged

The Happy Little Songbirds

And How to Win Them

MANY now know the joy of having these sweet little wild birdies sit on their hands, pick tidbits from their fingers and fly around in perfect confidence of protection for themselves and their offspring.

It is surprising how susceptible they are to acts of love. Rightly designed houses and some special prepared foods will quickly gain the friendship of the interesting little workers that rid your cherished trees, shrubs, flowers and premises of injurious moths, beetles, mites, mosquitoes, gnats and other insect pests.

Invariably Dodson's Scientifically Designed Houses placed as directed will get the same colony of beautiful Martins, Bluebirds, Flickers or Sweet Singing Wrens yearly. Also Cardinals, Thrushes, Grosbeaks, Mocking Birds and dozens of others will seek your garden if Dodson's Suet Cake in a sheltered feeding station is provided.

Enjoy nature's blessings by helping to preserve the Songbirds.

Dodson's Scientifically Designed and artistic Bird Houses are a feature in the most beautiful estates, country clubs and parks all over America.

Bluebird House

The happiest and most beloved Songsters. Dodson's Scientific Houses satisfy these most exacting birds. Made of oak, finished in white and green. Sizes 21 in. high by 16 in. in diameter, with 16 ft. easy-raising pole. Price, $14.00. For hanging only, $7.00.

Why Dodson Houses Win the Birds

Mr. Dodson has for many years devoted his entire time to lecturing, visiting beautiful estates in the study of wild birds all over America. Many seemingly insignificant details have been discovered and patented by him that are vital in the luring of Songbirds to man-made houses. Mr. Dodson is always willing to talk before clubs or associations interested in creating bird sanctuaries, either private or municipal.

A Song Bird Lover
for over 40 Years
ACTUAL PHOTO OF
Joseph H. Dodson (The Bird House Man)
PRESIDENT OF THE AMERICAN AUDUBON ASSOCIATION
Making friends with a Black Capped Chickadee at his Kankakee Bird Sanctuary

Children love to match the pictures with the birds

30 Beautiful Pictures of Songbirds, $1.00

Queen Anne Martin House

48 rooms for the beautiful Martins who colonize and eliminate the mosquitos at the rate of 3,000 a day per bird. Golf clubs write that mosquitos are noticeably diminished when their Martin Houses become occupied. Scientific porch, pure white, green trim. Cypress shingles, copper roof, including 22 ft. easy-raising pole. House 36 x 26 x 37 in. Price, $80.00. Others as low as $18.00. Houses made in sizes 24 to 56 rooms.

Automatic Feeding Shelter

Stocked with a few simple foods they crave and Dodson's Suet Cake and Grain Mixture, lures Songsters from the whole neighborhood. Automatically revolves to protect birds from storms. Cypress finished in white and green. Sizes 24x22 x 12 in. including 8-ft. pole, $8.50.

Bird Bath

This handsome stoneware bath is not only an ornament to any garden but is the only one where knowledge of the birds' habits, fears and preferences have been considered in designing a bath that the birds enjoy and use. Complete with 32 in. stand. Price, $26.00. Write for our big catalog of art stoneware furniture.

Dodson's Suet Cake, 40c a pound; Grain Mixtures, 10c a pound. Manchurian sunflower seeds, 25c a pound.

FREE

"Your Bird Friends and How to Win Them." My fascinating book sent to anyone who loves our beautiful Songbirds. It is full of things you should know. Based on 40 years' study of this interesting subject.

Wonderfully brilliant authentic pictures in natural colors on the order of the Cardinal Bird shown herewith. Leave the selection of birds found in your locality to us. Size 7x9 inches.

Flicker House

is an enticing lure for these very useful birds. Trees in cities are so well taken care of that Flickers have difficulty in finding homes. They, therefore, take very readily to Dodson's Scientifically Built Houses. Flickers are one of the most useful birds, destroying moths, tree pests and principally ants on trees and ground. Many letters have been received stating that ants have mysteriously vanished since these birds have found homes. House 26½ in. high by 18 in. in diameter. Price, $7.00

Dodson's Scientific Wren House

as shown at left wins the Silver Throated Wren, one of our sweetest singers. A four-compartment house satisfies their habit of changing nests for each of their three broods. Beautiful design, made of oak, finished in green with cypress shingles, copper coping; comes complete with rust-proof snap on hanger. Size 28 in. high by 18 in. in diameter. Price, $7.00.

CARDINAL BIRD

Will haunt your Automatic Feeding Shelter

Protect the Songbirds from marauders. Dodson's Guaranteed Sparrow Trap rids your premises of these pests.

ORDER DIRECT FROM THIS AD

Dodson's Scientifically Designed Houses can only be bought from:

JOSEPH H. DODSON, INC.

Mr. Dodson is President of the American Audubon Association

744 HARRISON AVENUE KANKAKEE, ILLINOIS